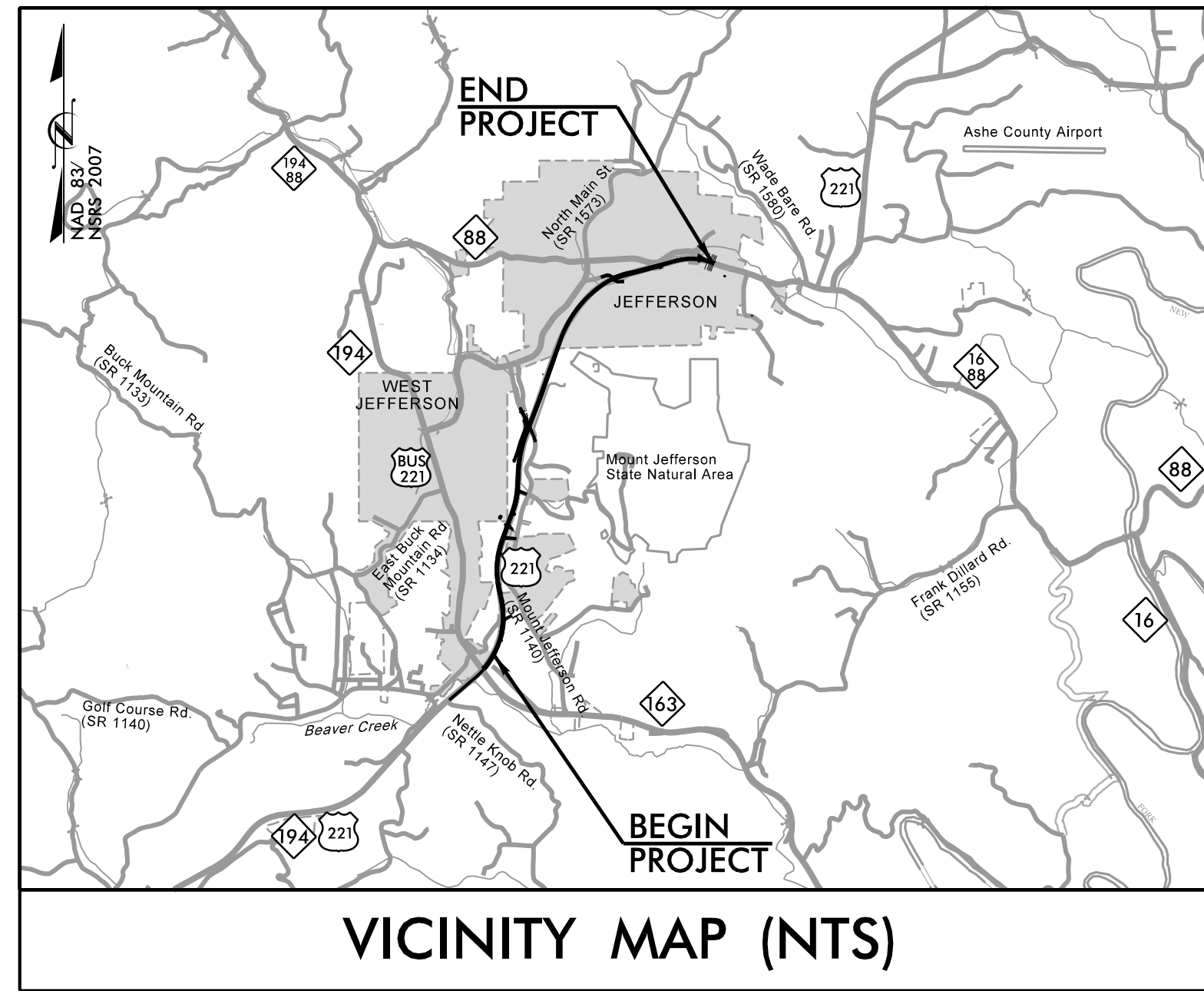
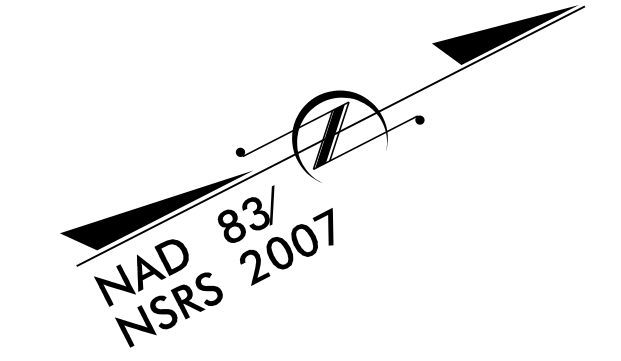
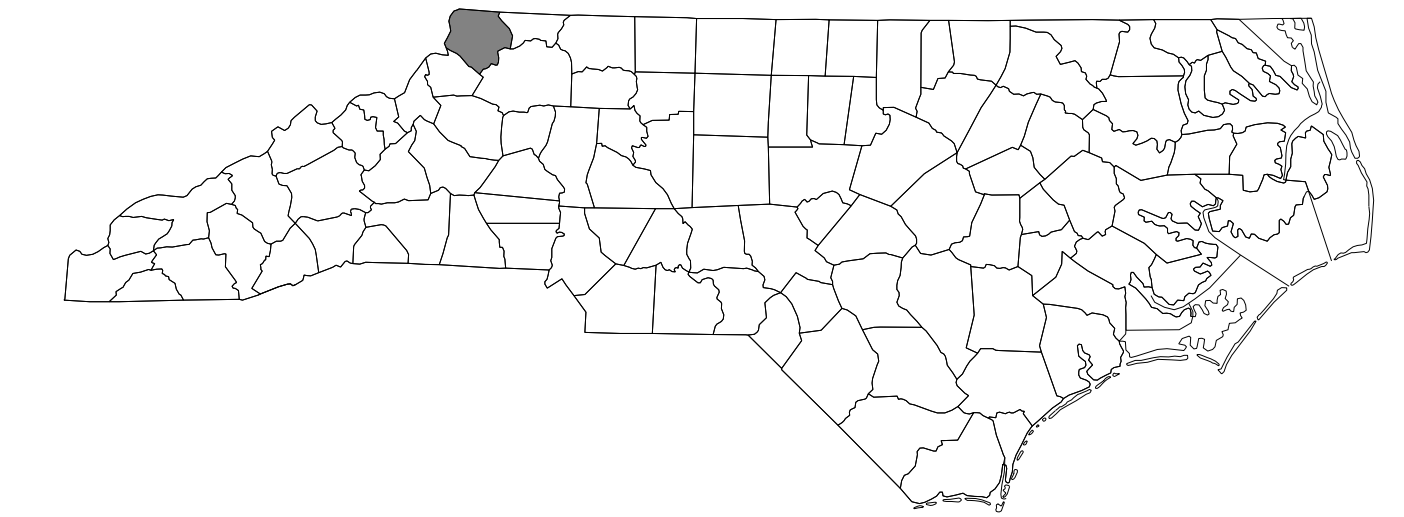


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

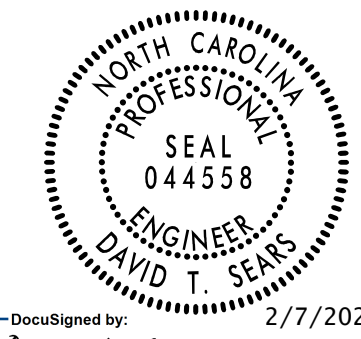
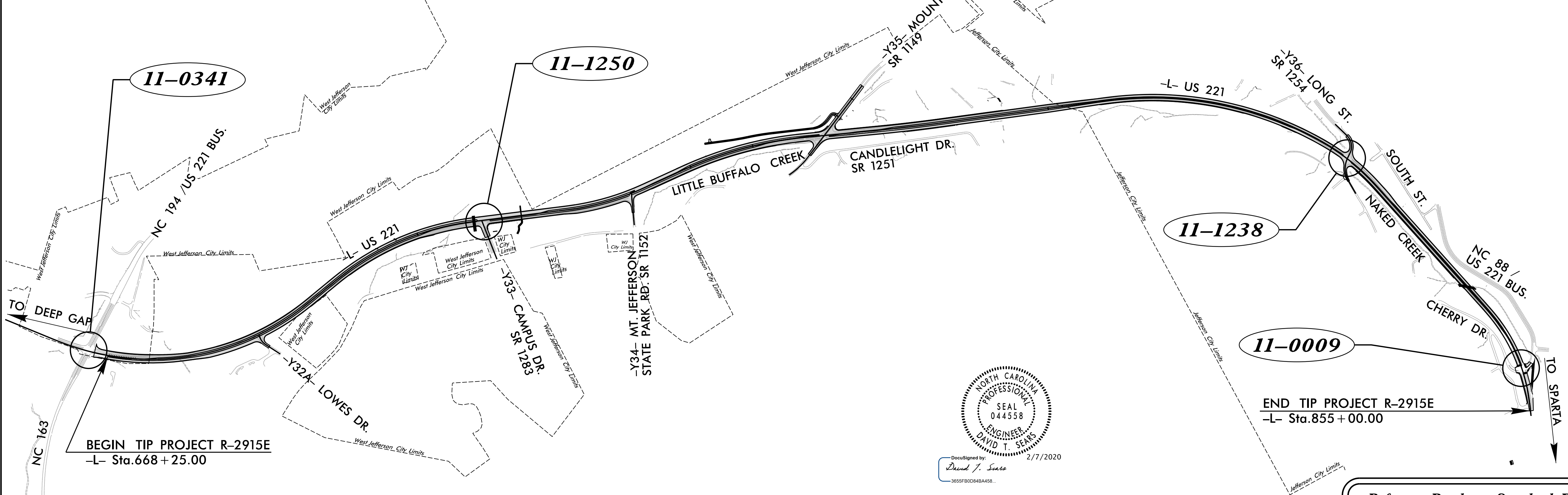
ASHE COUNTY

LOCATION: US 221 FROM US 221 BYPASS TO
US 221 BUSINESS/NC 88 IN JEFFERSON
TYPE OF WORK: TRAFFIC SIGNALS



VICINITY MAP (NTS)

TIP PROJECT: R-2915E



DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

Refer to Roadway Standard Drawings
NCDOT dated January 2018 and
Standard Specifications for Roads
and Structures dated January 2018.

CONTRACT:

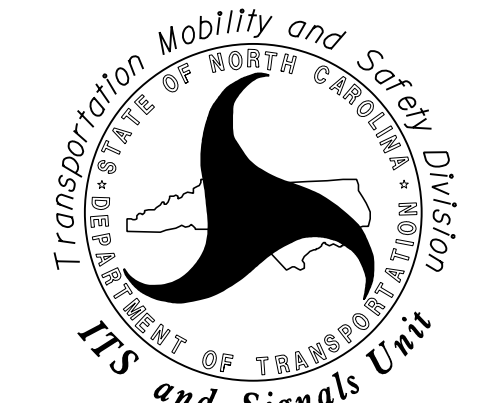
Index of Plans

Sheet #	Reference #	Location/Description
Sig. 1	---	Title Sheet
Sig. 2.0-7.2	11-0341	US 221-NC 194 AT US 221 BUSINESS - NC 194/NC 163
Sig. 8.0-11.1	11-1250	US 221 AT SR 1283 (CAMPUS DR.)
Sig. 12.0-16.2	11-1238	US 221 AT SR 1254 (LONG STREET)
Sig. 17.0-21.2	11-0009	US 221 AT NC 88-US 221 BUSINESS /CHERRY DR.
Sig. 22.0-22.1	N/A	DETAIL DRAWINGS TO BE USED IN LIEU OF 2018 NCDOT ROADWAY STANDARD DRAWINGS
Sig. M1-M8	N/A	STANDARD DRAWINGS FOR METAL POLES

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:

Timothy J. Williams, P.E. - Western Region Signals Engineer
D. Todd Joyce, P.E. - Signal Equipment Design Review Engineer
Gregory A. Green - Signal Communications Project Engineer

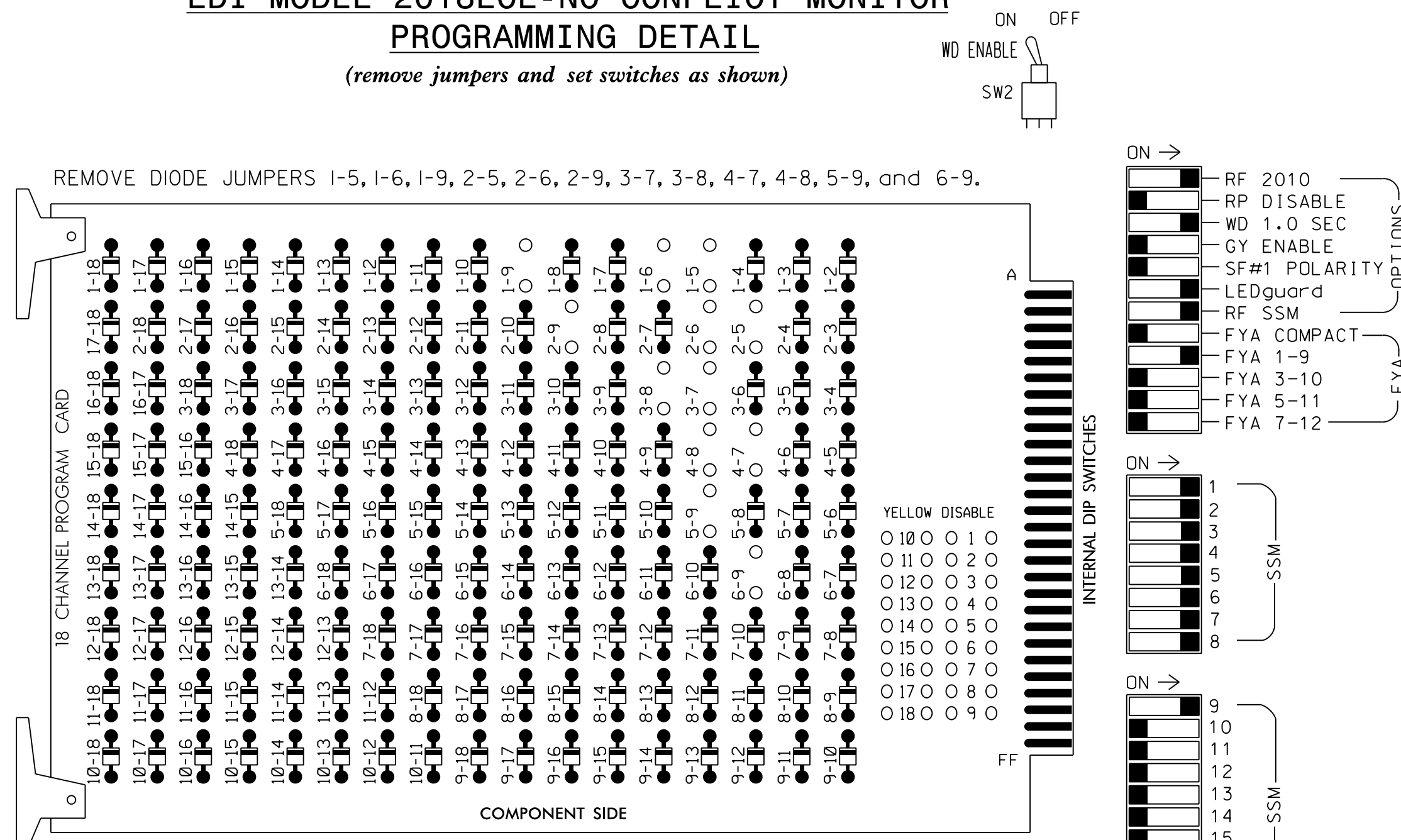
Prepared in the Office of:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY
DIVISION



2/7/2020 R:\Traf Fic\Signals\Design\Signals\R-2915E.sig-fsh.dgn

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	22	31	41,42	NU	42	51,52	61,62	NU	62	72	81,82	NU	11★	NU
RED	*	128				101				134					107			
YELLOW		129				102				135					108			
GREEN		130				103				136					109			
RED ARROW						116				131					122			A121
YELLOW ARROW	126					117	117			132	132				123	123		A122
FLASHING YELLOW ARROW																		A123
GREEN ARROW	127	127				118	118			133	133				124	124		

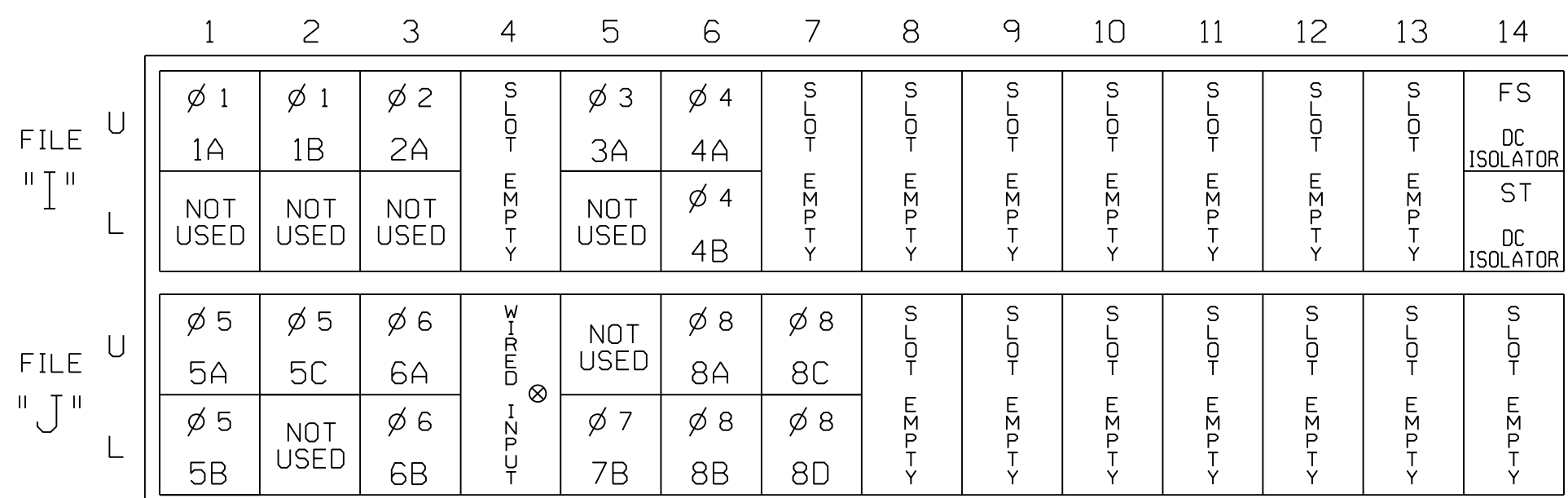
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

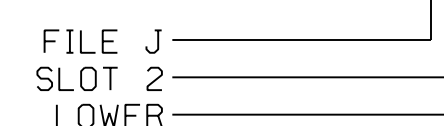
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	J1U	56	18	1	1	Y	Y			15
1B	TB2-5,6	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-9,10	J3U	63	25	32	2	Y	Y			
3A	TB4-5,6	J5U	58	20	3	3	Y	Y			
4A	TB4-9,10	J6U	41	3	4	4	Y	Y			
4B	TB4-11,12	J6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y		2.4	
8B	TB5-11,12	J6L	46	8	18	8	-	Y		2.4	
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			

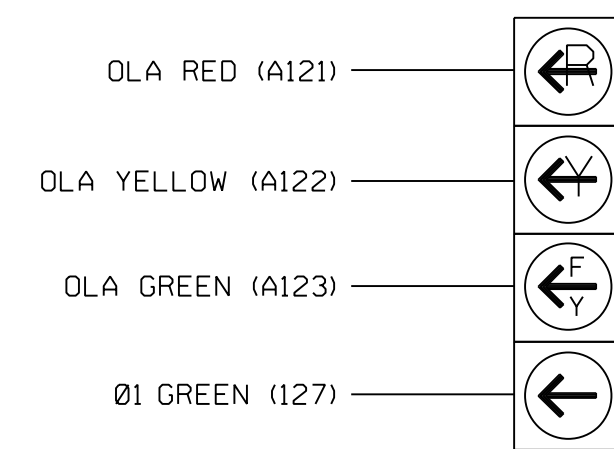
¹Add jumper from J11-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



11

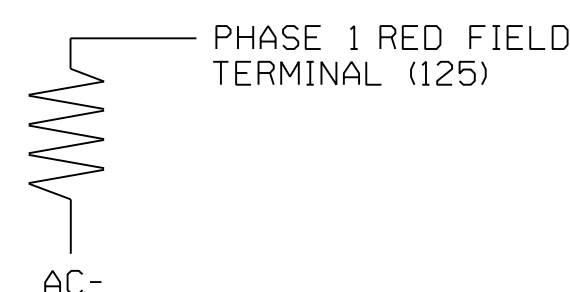
NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

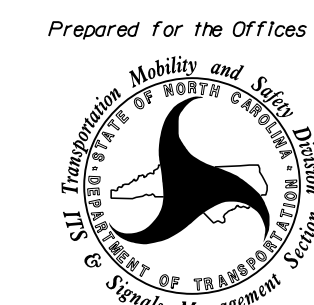
VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



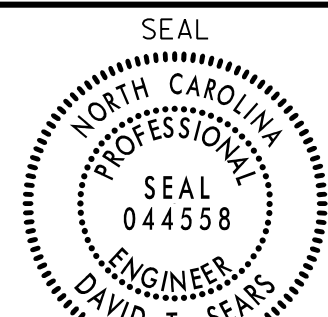
ELECTRICAL DETAIL - TEMPORARY DESIGN 1 - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:



US 221-NC 194		AT	
US 221 BUSINESS-NC 194/NC 163			
DIVISION 11	ASHE COUNTY	WEST JEFFERSON	
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS		
PREPARED BY: W.P. JONES	REVIEWED BY:		
REVISIONS	INIT.	DATE	



DocuSigned by:
 David T. Sears
 2/7/2020

SIG. INVENTORY NO. 11-034111

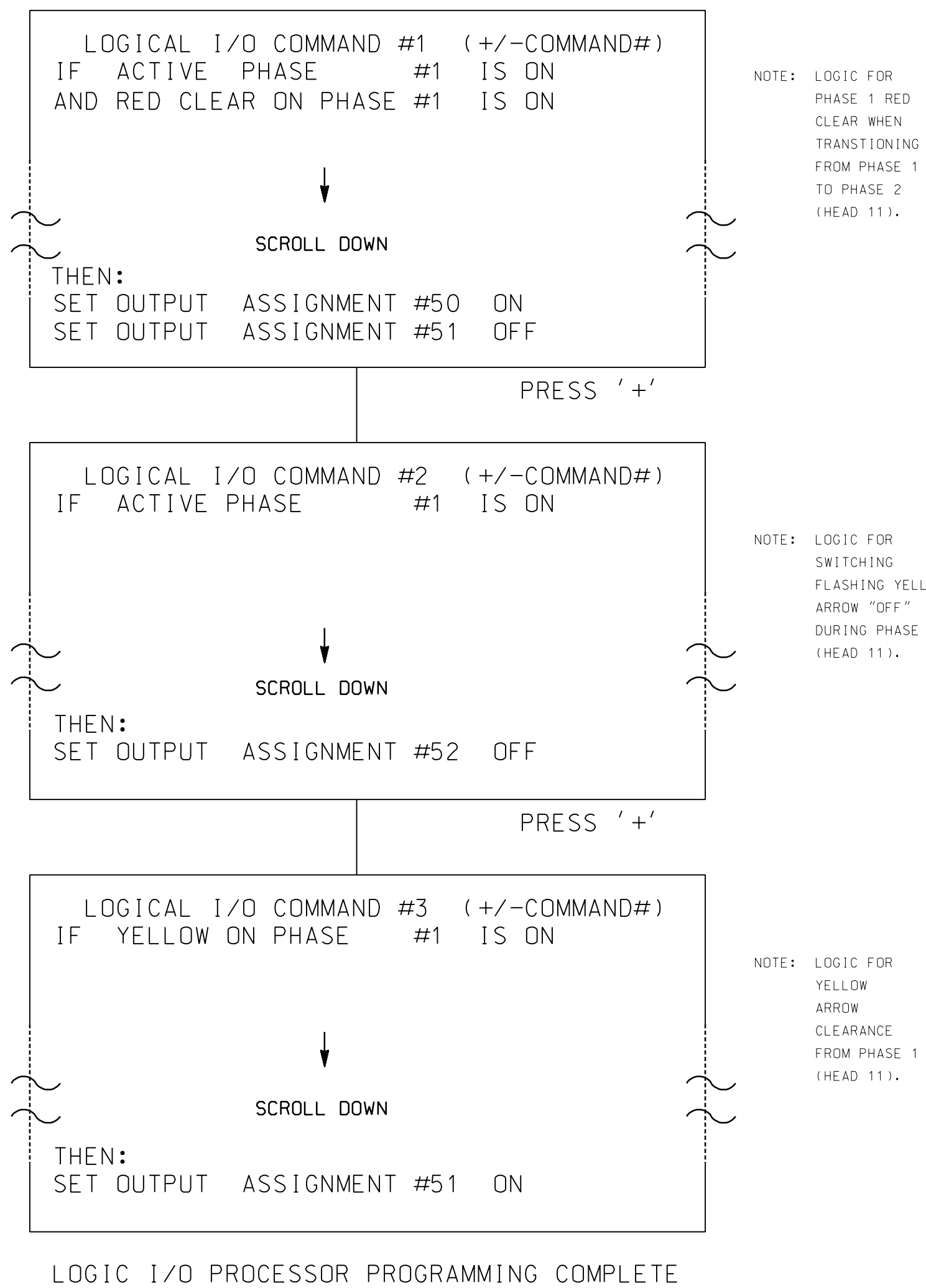
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750 N. Greenfield Pkwy, Garner, NC 27529

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341T1
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 1 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

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Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163	
DIVISION 11 ASHE COUNTY WEST JEFFERSON	
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
044558
DAVID T. SEARS
2/7/2020
SIGNATURE DATE
SIG. INVENTORY NO. 11-0341T1

PHASING DIAGRAM

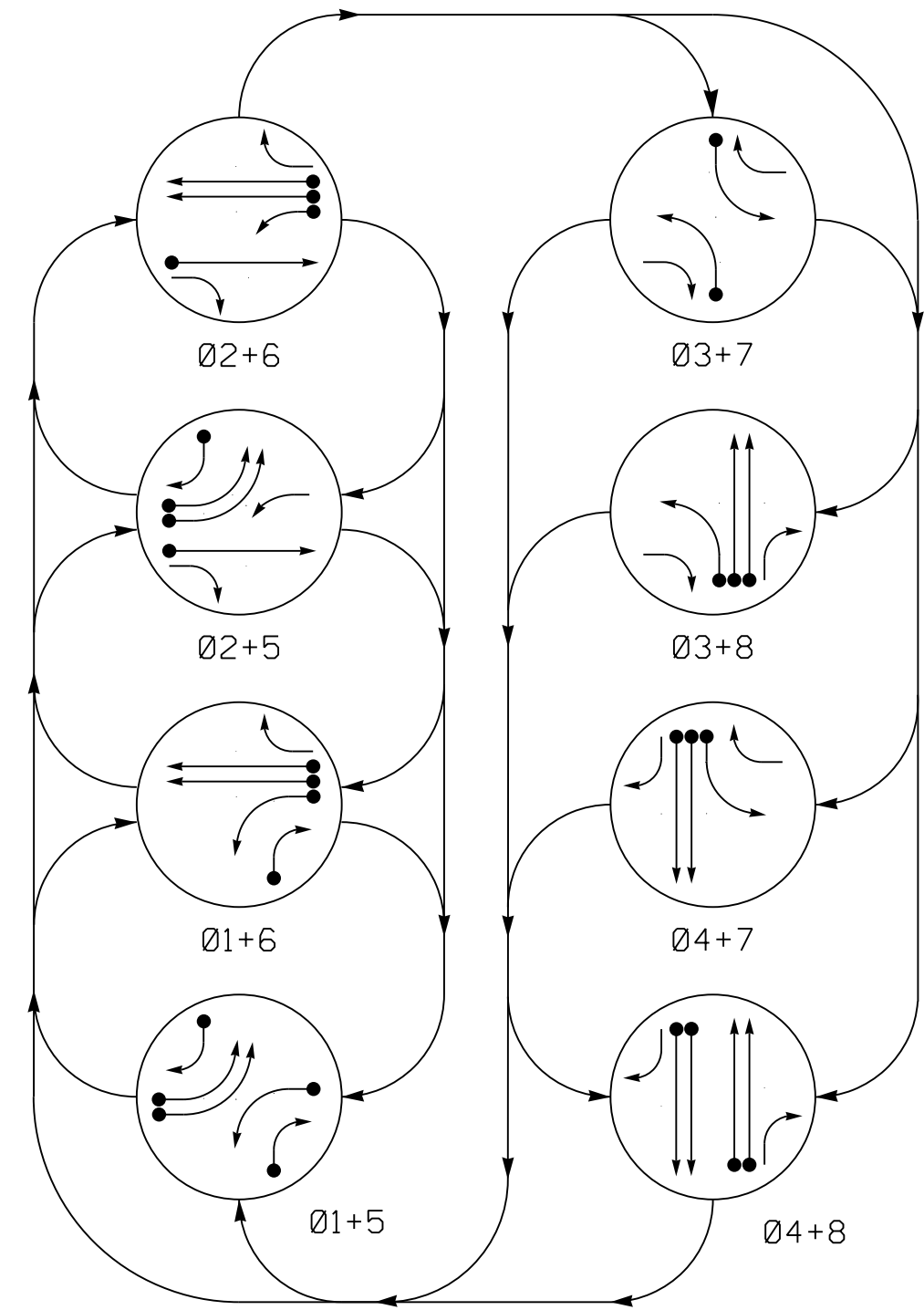


TABLE OF OPERATION

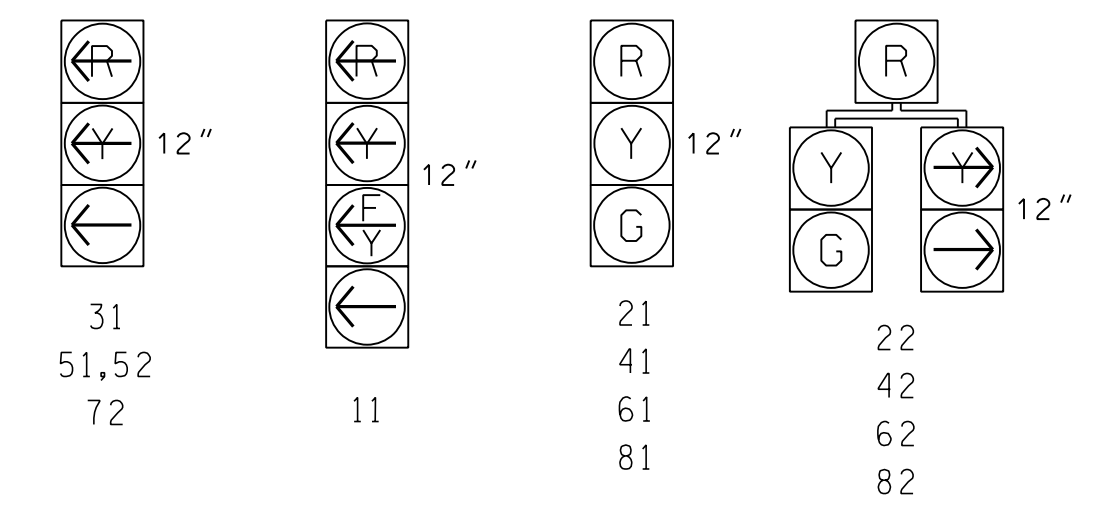
SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
72	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	G	G	R	R

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← ○ UNSIGNALIZED MOVEMENT
- ← ○ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



8 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
- DISCONNECT EXISTING LOOP 2A AND RECONNECT EXISTING LOOP 2B.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD		
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME	
1A	6x40	0	2-4-2	-	1	Y	Y	-	-	15	-	-	
1B	6x40	0	2-4-2	-	6	Y	Y	Y	-	3	-	-	
2A	6x6	420	EXIST	-	DISCONNECTED							-	-
2B	6x6	420	EXIST	-	2	Y	Y	-	-	-	-	-	
3A	6x40	0	2-4-2	-	3	Y	Y	-	-	-	-	-	
4A	6x40	0	2-4-2	-	4	Y	Y	-	-	-	-	-	
4B	6x40	0	2-4-2	-	4	Y	Y	-	-	-	-	-	
5A	6x40	0	4-2-4	-	5	Y	Y	-	-	-	-	-	
5B	6x40	0	4-2-4	-	5	Y	Y	-	-	-	-	-	
5C	6x40	0	4-2-4	-	5	Y	Y	-	-	15	-	-	
6A	6x6	420	EXIST	-	6	Y	Y	-	-	-	-	-	
6B	6x6	420	EXIST	-	6	Y	Y	-	-	-	-	-	
7A	6x40	0	2-4-2	-	DISCONNECTED							-	-
7B	6x40	0	2-4-2	-	7	Y	Y	-	-	-	-	-	
8A	6x6	300	EXIST	-	8	-	Y	-	2.4	-	-	-	
8B	6x6	300	EXIST	-	8	-	Y	-	2.4	-	-	-	
8C	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-	
8D	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-	

LEGEND

- | | |
|--|--|
| PROPOSED | EXISTING |
| ○ → Traffic Signal Head | ● → Traffic Signal Head |
| ○ → Modified Signal Head | ○ → Modified Signal Head |
| ○ → Sign | ○ → Sign |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → Pedestrian Signal Head With Push Button & Sign |
| ○ → Signal Pole with Guy | ○ → Signal Pole with Guy |
| ○ → Signal Pole with Sidewalk Guy | ○ → Signal Pole with Sidewalk Guy |
| □ → Inductive Loop Detector Controller & Cabinet | □ → Inductive Loop Detector Controller & Cabinet |
| □ → Junction Box | □ → Junction Box |
| □ → 2-in Underground Conduit | □ → 2-in Underground Conduit |
| → → Right of Way | → → Right of Way |
| → → Directional Arrow | → → Directional Arrow |
| → → Guardrail | → → Guardrail |
| ○ → Metal Strain Pole | ○ → Metal Strain Pole |
| ○ → Construction Zone Drums | ○ → Construction Zone Drums |
| ■ → Construction Zone | ■ → Construction Zone |

OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	20	100	20	30	20	100	20	30
Yellow Clearance	3.0	5.5	3.0	3.8	3.0	5.5	3.0	4.1
Red Clearance	3.8	1.8	3.5	2.5	4.0	1.8	3.8	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	1.5	-	-
Max Variable Initial *	-	46	-	-	-	46	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	45	-	-	-	45	-	-
Minimum Gap	-	3.4	-	-	-	3.4	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL UPGRADE - TEMPORARY DESIGN 2 - CONSTRUCTION PHASE II

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Prepared for:
 Transportation Mobility and Safety Solutions
 UNIVERSITY OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529
 SCALE: 0 40
 1" = 40'

US 221-NC 194
 AT
 US 221 BUSINESS- NC 194/NC 163
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: INIT. DATE

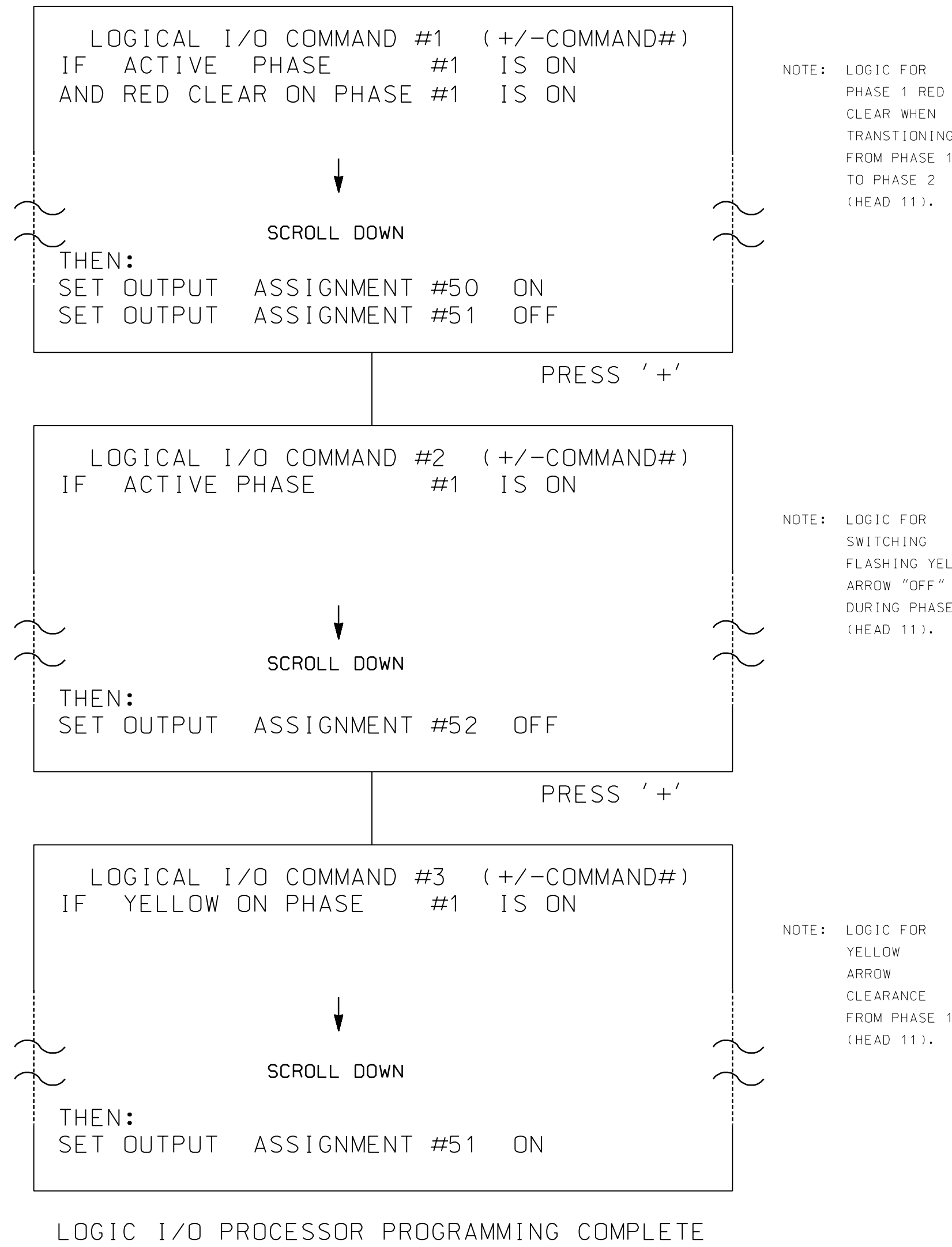
SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-0341T2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  - RED  - YELLOW  - GREEN
FLASH COLORS:   - RED  - YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

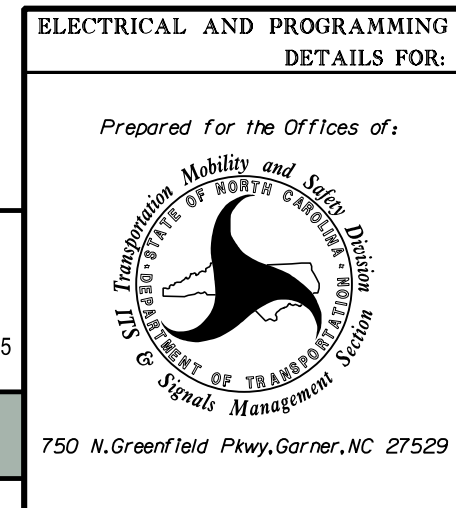
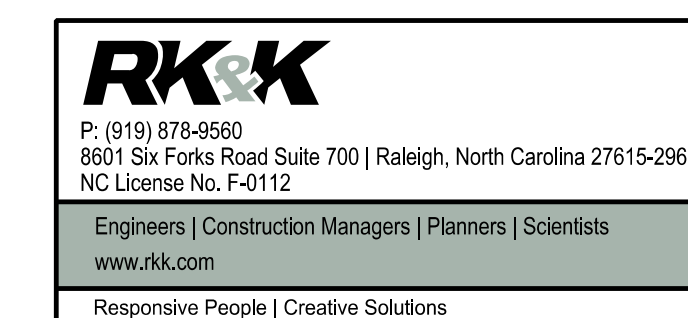
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341T2
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 2 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
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SIGNATURES COMPLETED

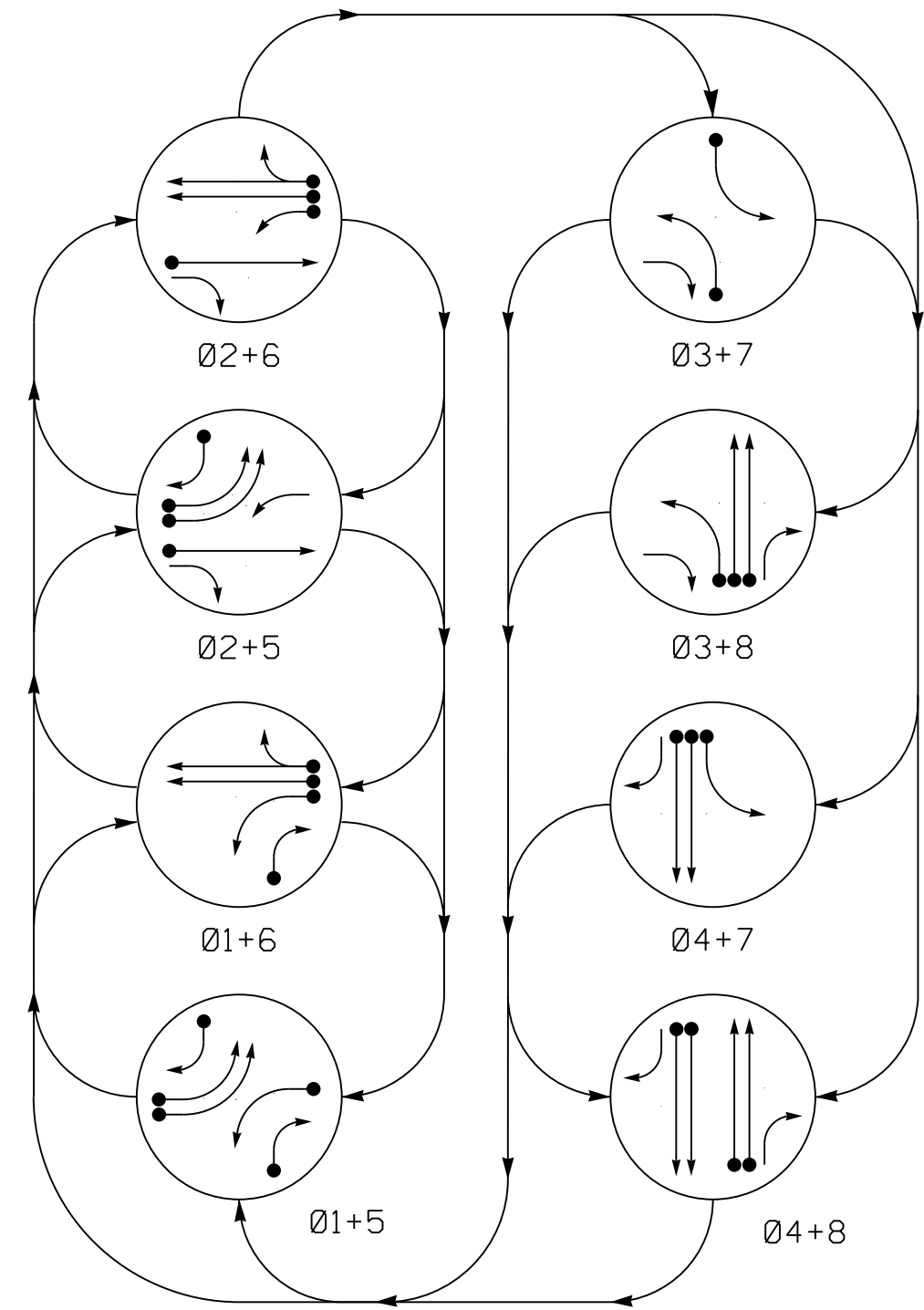


US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163	
DIVISION 11	ASHE COUNTY WEST JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL	DATE
DAVID T. SEARS	2/7/2020
SIGNATURE	DATE
SIG. INVENTORY NO. 11-0341T2	

2/7/2020 R:\Projects\11-0341T2.dgn

PHASING DIAGRAM



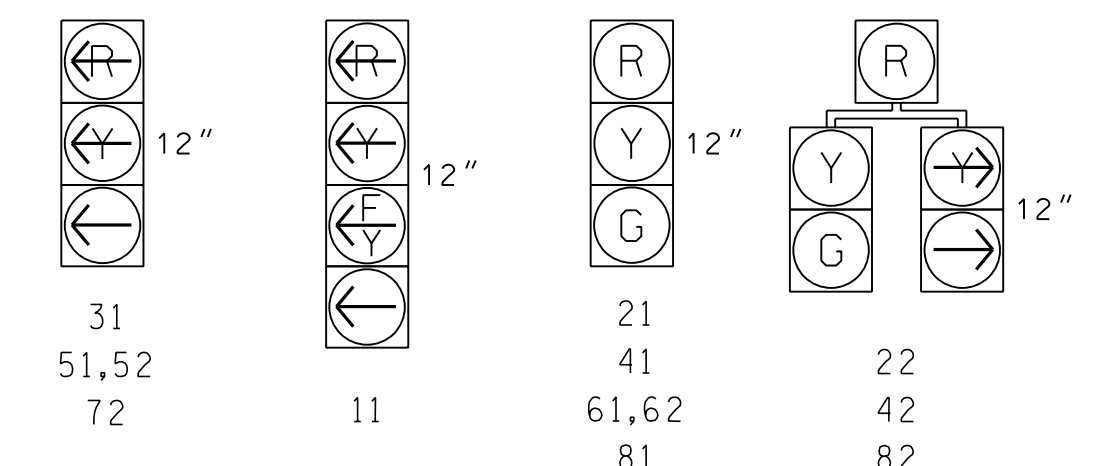
SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61,62	R	G	R	G	R	R	R	Y
72	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	R	G
82	R	R	R	R	G	R	G	R

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← ○ UNSIGNALIZED MOVEMENT
- ← ○ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



8 PHASE FULLY ACTUATED (ISOLATED)

NOTES

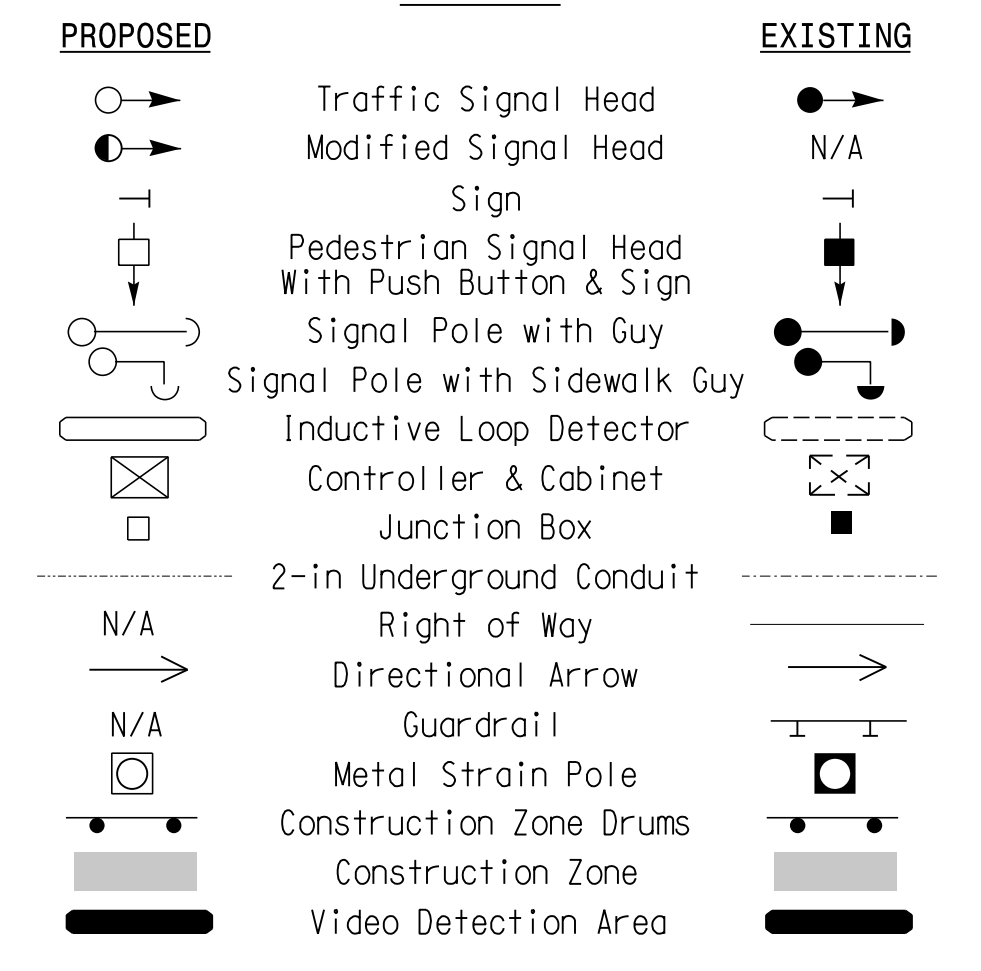
- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 11 AND 61.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD		
					PHASE	CALLING	EXTENSION	STRETCH TIME			DELAY TIME	
1A	6X40	0	*	*	1	Y	Y	-	15	-	*	
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	-	-	
2A	6X6	420	EXIST	-	DISCONNECTED						-	-
2B	6X6	420	EXIST	-	2	Y	Y	-	-	-	-	
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	
5A	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-	
5B	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-	
5C	6X40	0	4-2-4	-	5	Y	Y	-	15	-	-	
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	*	
6B	6X6	110	*	*	6	Y	Y	-	-	-	*	
6C	6X6	110	*	*	6	Y	Y	-	-	-	*	
7A	6X40	0	2-4-2	-	DISCONNECTED						-	-
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	
8A	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-	
8B	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-	
8C	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	
8D	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	

* Video Detection

LEGEND



OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	100	20	30	20	100	20	30
Yellow Clearance	3.0	5.5	3.0	3.8	3.0	5.5	3.0	4.1
Red Clearance	3.7	1.8	3.5	2.5	3.9	1.8	3.8	1.6
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	-	-	-
Max Variable Initial *	-	46	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	-	-	-
Time To Reduce *	-	45	-	-	-	-	-	-
Minimum Gap	-	3.4	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL UPGRADE - TEMPORARY DESIGN 3 - CONSTRUCTION PHASE III

RK&K
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 8801 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
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 Engineers | Construction Managers | Planners | Scientists
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 Transportation Mobility and Safety Solutions
 UNIVERSITY OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529

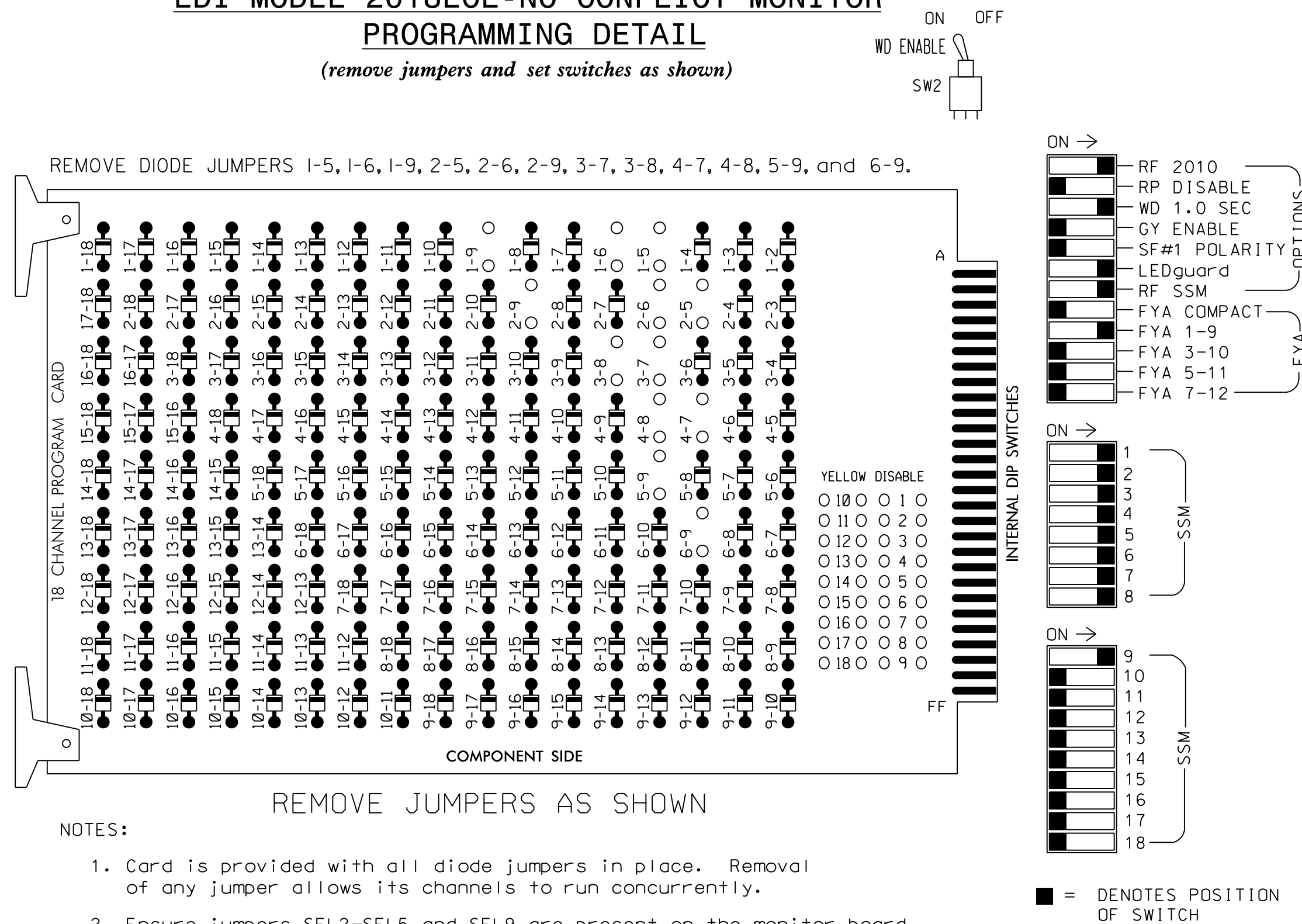
US 221-NC 194
 AT
 US 221 BUSINESS- NC 194/NC 163
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS INIT. DATE
 SCALE 0 40
 1" = 40'

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-0341T3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

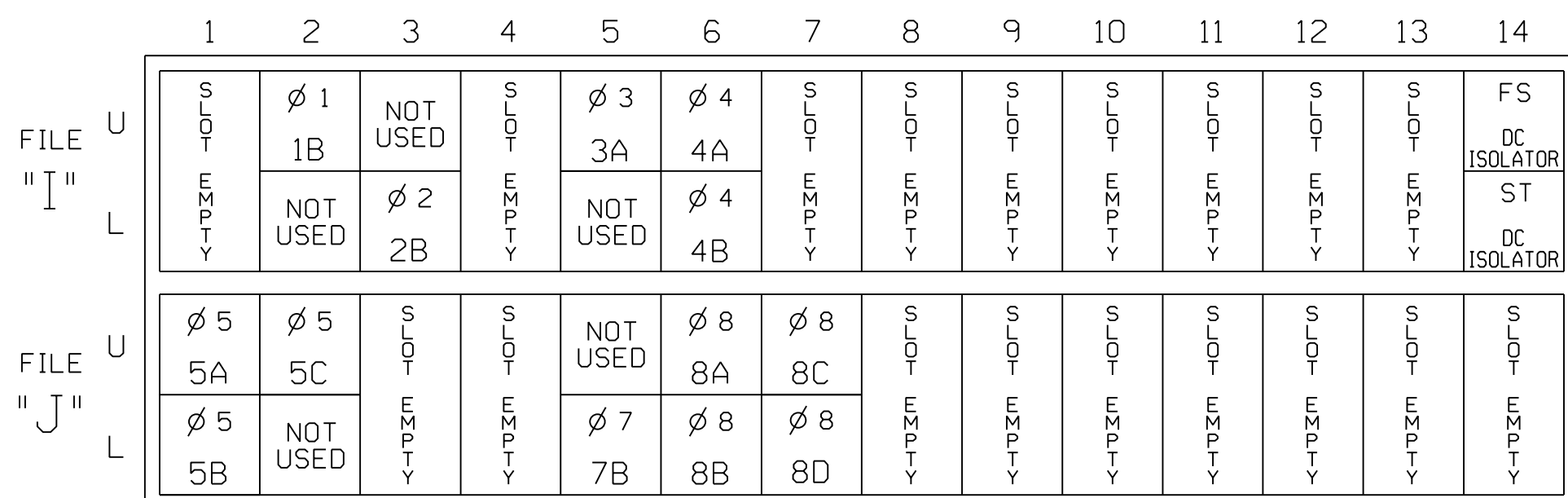
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6	
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18	
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE	
SIGNAL HEAD NO.	11	82	21,22	NU	22	31	41,42	NU	42	51,52	61,62	NU	72	81,82	NU	11	NU	NU	NU
RED	*	128			101				134			107							
YELLOW		129			102				135			108							
GREEN		130			103				136			109							
RED ARROW					116				131			122							A121
YELLOW ARROW	126			117	117				132	132		123							A122
FLASHING YELLOW ARROW																			A123
GREEN ARROW	127	127		118	118				133	133		124							

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

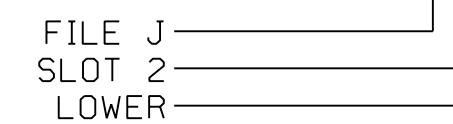
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

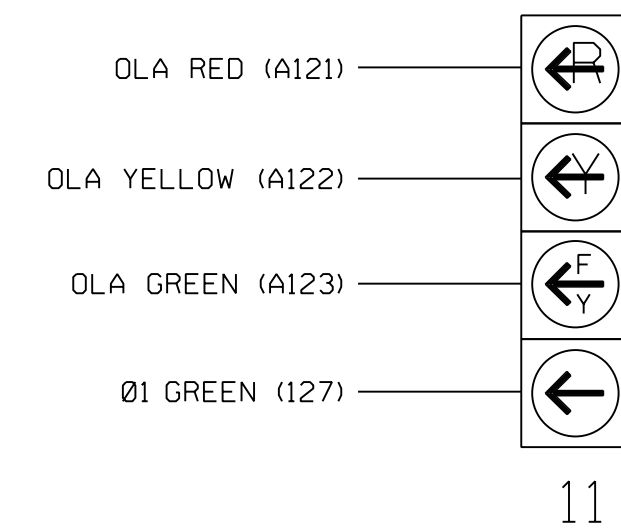
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y		2.4	
8B	TB5-11,12	J6L	46	8	18	8	-	Y		2.4	
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

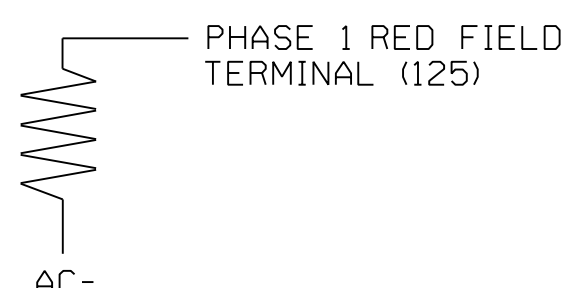


NOTE
 The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



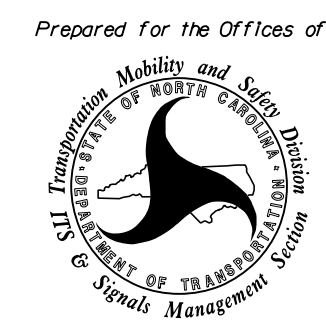
SPECIAL DETECTOR NOTE

For zones 1A, 6A, 6B, and 6C install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPORARY DESIGN 3 - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR:

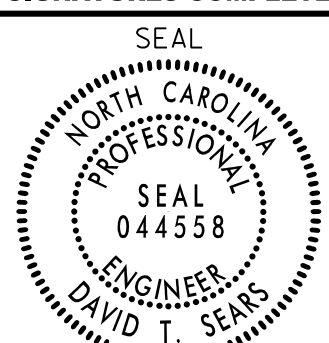


750 N. Greenfield Pkwy, Garner, NC 27529

US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163

DIVISION 11 ASHE COUNTY WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS
 PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE



DocuSigned by David T. Sears 2/7/2020

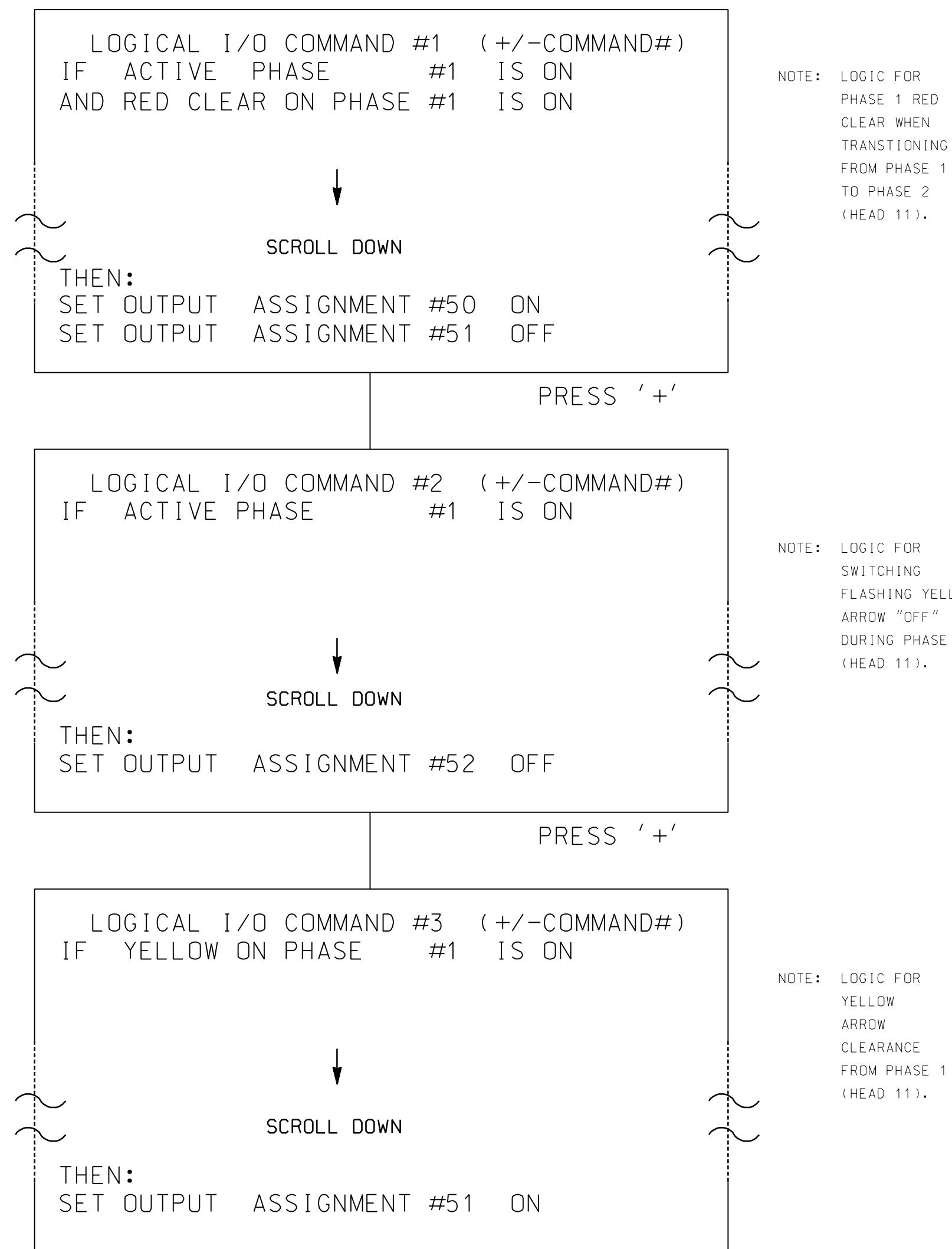
SIG. INVENTORY NO. 11-0341T3

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LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  _ RED  _ YELLOW  _ GREEN
FLASH COLORS:   _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

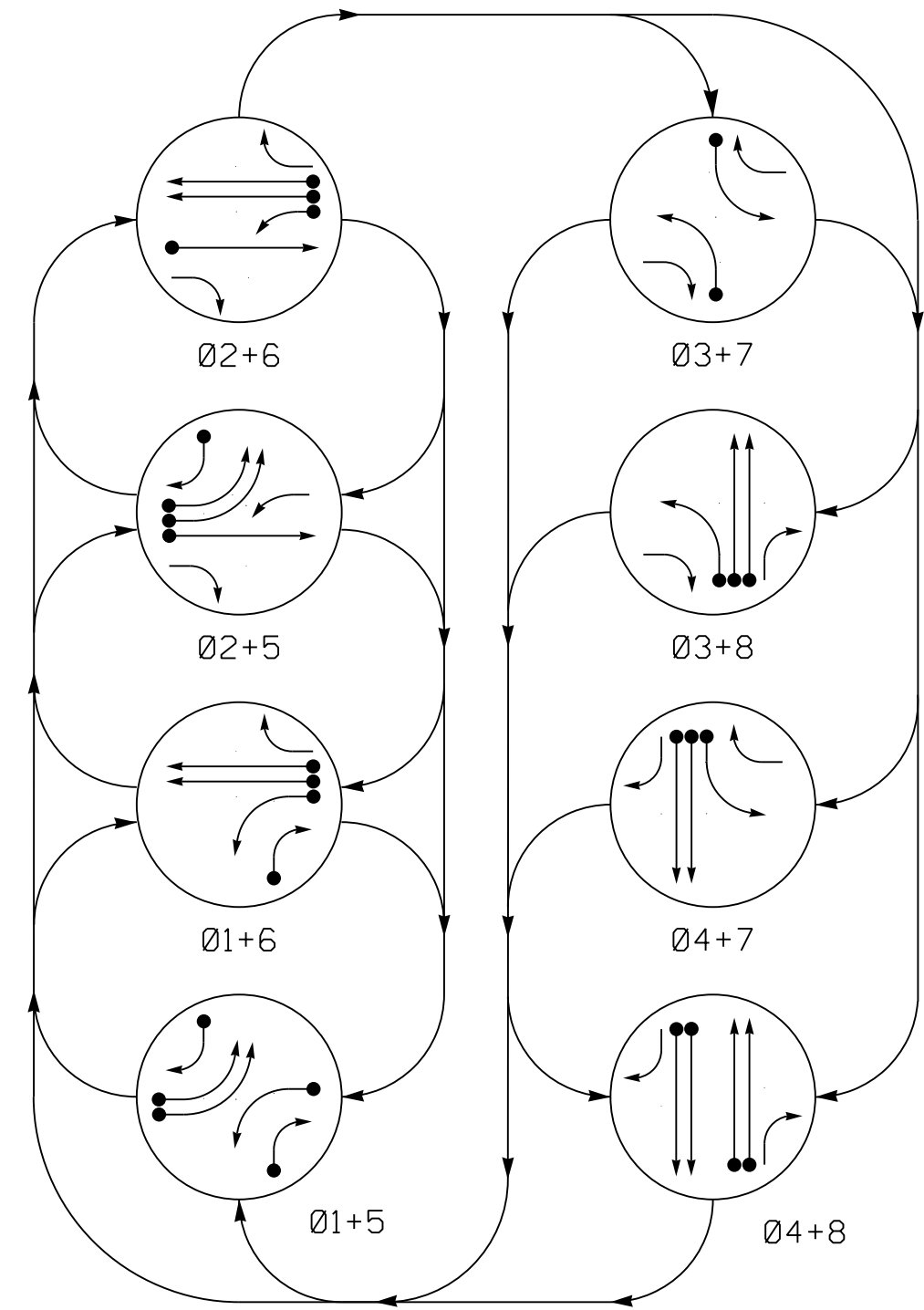
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341T3
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 3 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="text-align: center; font-size: small;">Prepared for the Offices of: STATE OF NORTH CAROLINA Department of Transportation Office of Signal Management</p>	<p style="font-size: large; font-weight: bold;">US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163</p> <p style="font-size: x-small;">DIVISION 11 ASHE COUNTY WEST JEFFERSON</p> <p style="font-size: x-small;">PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS</p> <p style="font-size: x-small;">PREPARED BY: W.P. JONES REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS 044558</p> <p style="font-size: x-small;">DocuSigned by: <i>David T. Sears</i> 2/7/2020</p> <p style="font-size: x-small;">SIGNATURE DATE</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p> <p>RK&K</p> <p>P: (919) 878-8560 8801 Six Forks Road Suite 700 Raleigh, North Carolina 27615-2965 NC License No. F-0112 www.rk.com</p> <p style="font-size: xx-small;">Engineers Construction Managers Planners Scientists Responsive People Creative Solutions</p>
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<p>SIG. INVENTORY NO. 11-0341T3</p>															

PHASING DIAGRAM

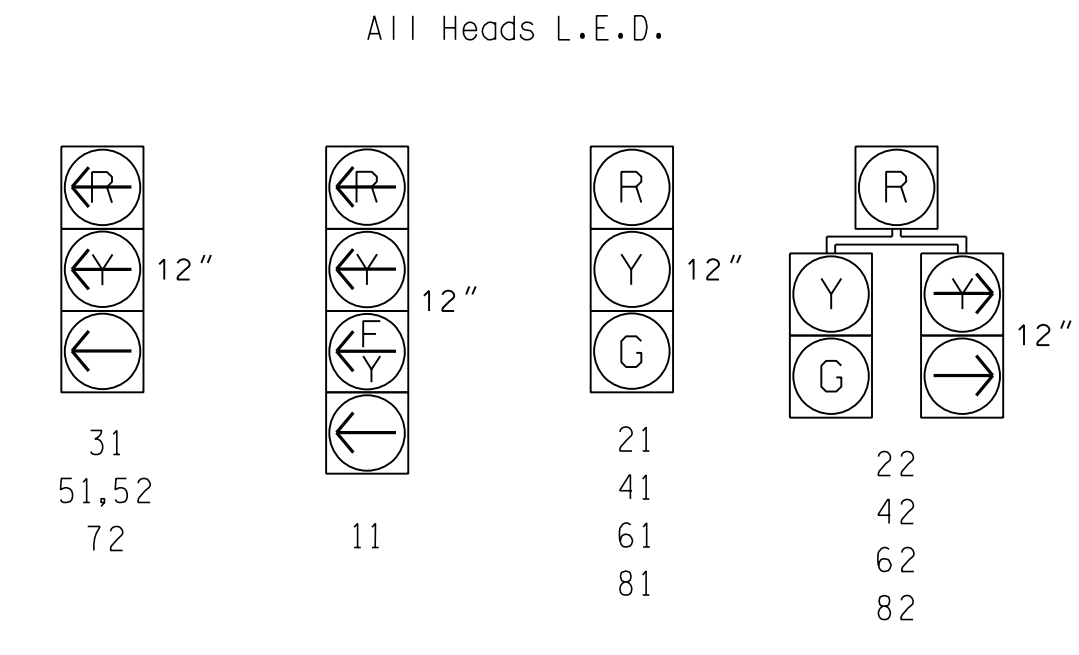


SIGNAL FACE	PHASE							
	01+5	01+6	02+5	02+6	03+7	03+8	04+7	04+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
72	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	G	G	R	R

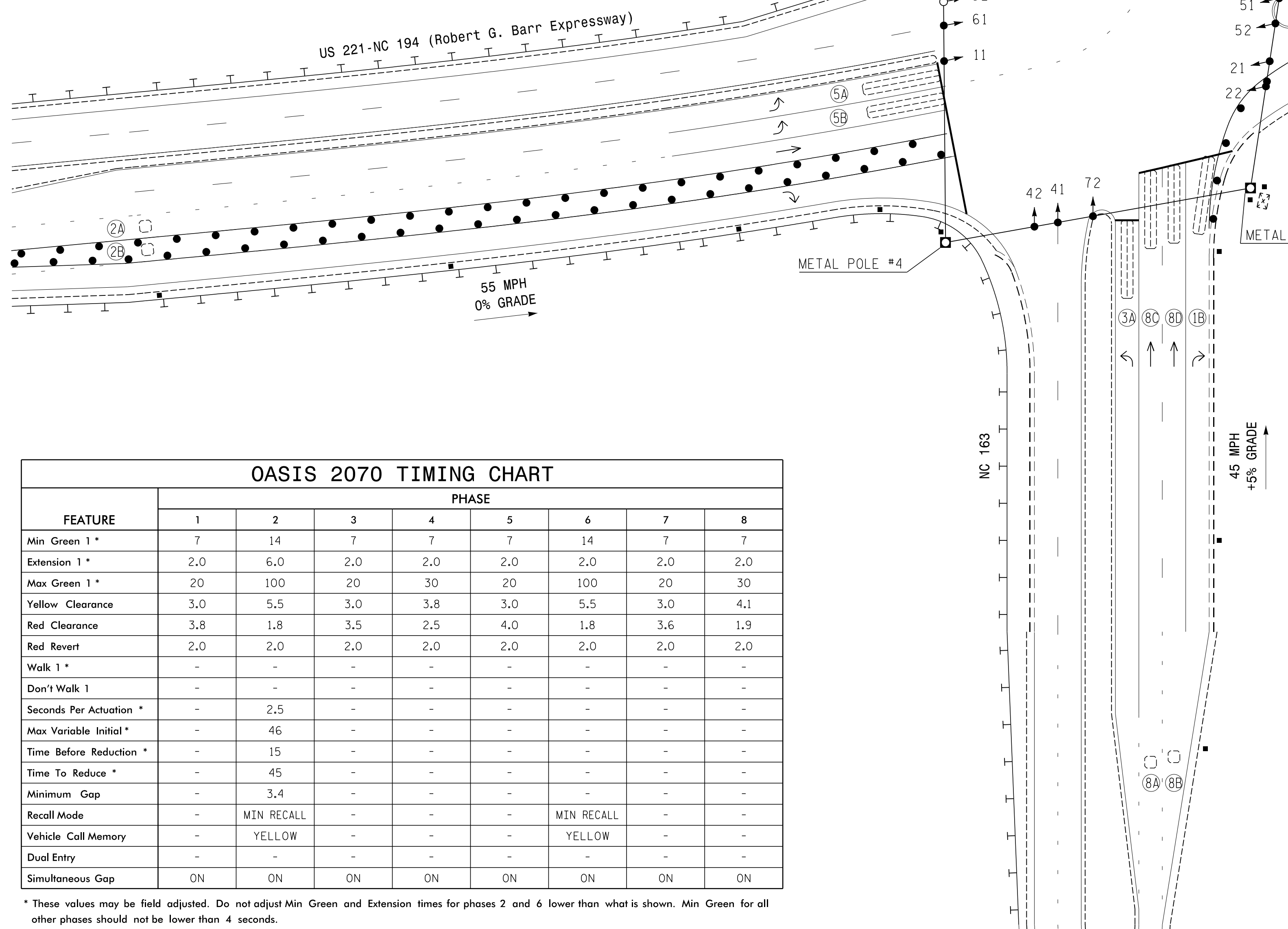
PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← ○ UNSIGNALIZED MOVEMENT
- ← ○ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.



8 PHASE FULLY ACTUATED (ISOLATED)



FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	100	20	30	20	100	20	30
Yellow Clearance	3.0	5.5	3.0	3.8	3.0	5.5	3.0	4.1
Red Clearance	3.8	1.8	3.5	2.5	4.0	1.8	3.6	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	-	-	-
Max Variable Initial *	-	46	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	-	-	-
Time To Reduce *	-	45	-	-	-	-	-	-
Minimum Gap	-	3.4	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

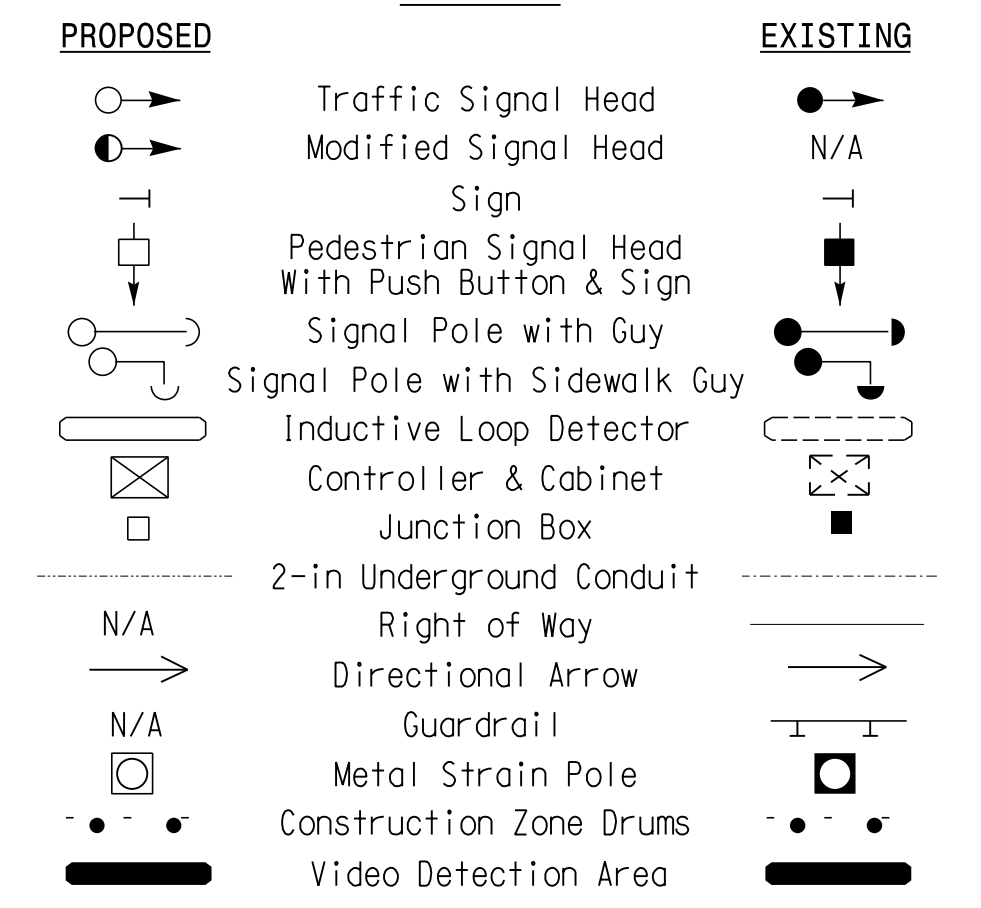
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6x40	0	*	*	1	Y	Y	-	-	15	-	*
1B	6x40	0	2-4-2	-	1	Y	Y	-	-	15	-	*
2A	6x6	420	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6x6	420	EXIST	-	DISCONNECTED							
3A	6x40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
4A	6x40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6x40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6x40	0	4-2-4	-	5	Y	Y	-	-	-	-	-
5B	6x40	0	4-2-4	-	5	Y	Y	-	-	-	-	-
5C	6x40	0	4-2-4	-	5	Y	Y	-	-	15	-	-
6A	6x6	420	*	*	6	Y	Y	-	2.2	-	-	*
6B	6x6	420	*	*	6	Y	Y	-	2.2	-	-	*
6C	6x6	110	*	*	6	Y	Y	-	-	-	-	*
6D	6x6	110	*	*	6	Y	Y	-	-	-	-	*
7A	6x40	0	2-4-2	-	DISCONNECTED							
7B	6x40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
8A	6x6	300	EXIST	-	8	-	Y	-	2.4	-	-	-
8B	6x6	300	EXIST	-	8	-	Y	-	2.4	-	-	-
8C	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8D	6x40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

* Video Detection

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 11 AND 61.
- DISCONNECT EXISTING LOOP 2B AND RECONNECT EXISTING LOOP 2A.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.

LEGEND



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE - TEMPORARY DESIGN 4 - CONSTRUCTION PHASE IV

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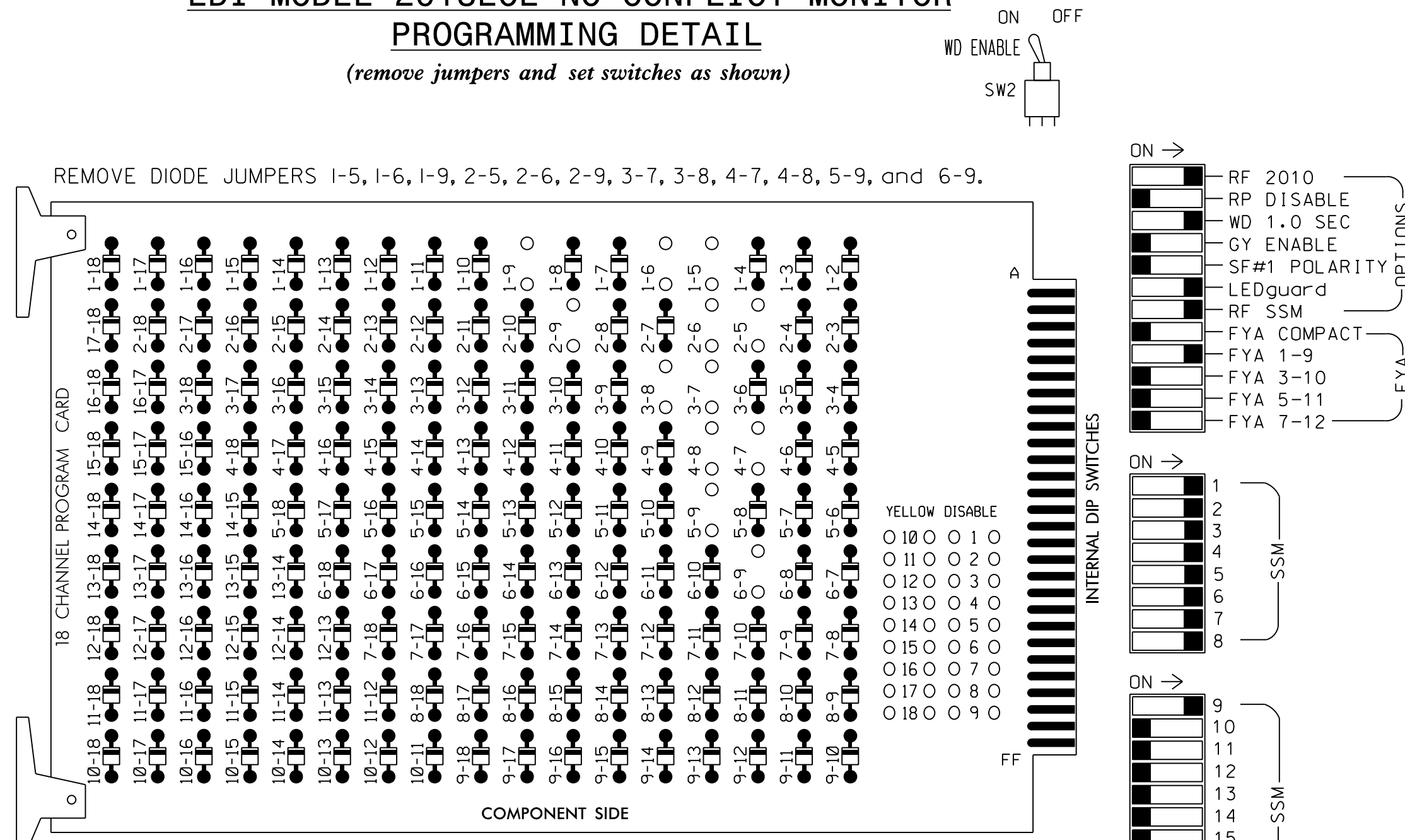
Prepared for:
 Transportation Mobility and Safety Solutions
 UNIVERSITY OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

US 221-NC 194
 AT
 US 221 BUSINESS- NC 194/NC 163
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS INIT. DATE

SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-0341T4

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Variable Initial and Gap Reduction.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

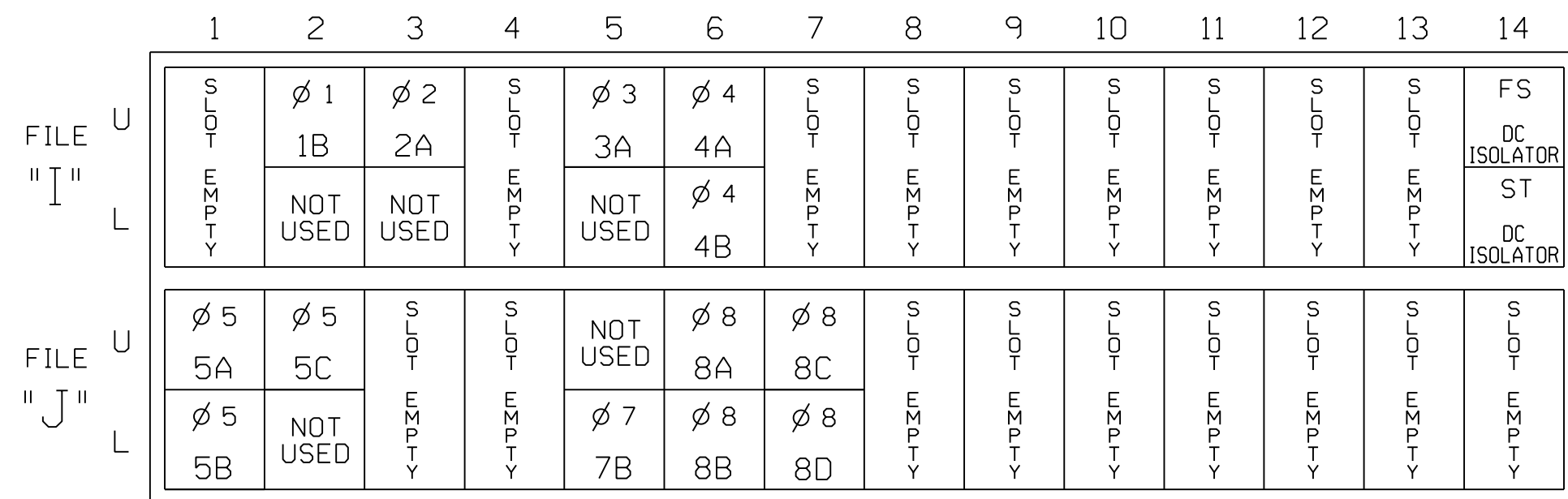
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	NU	22	31	41,42	NU	42	51,52	61,62	NU	62	72	81,82	NU	11	NU
RED	*	128			101					134					107			
YELLOW		129			102					135					108			
GREEN		130			103					136					109			
RED ARROW					116					131					122			A121
YELLOW ARROW		126			117	117				132	132				123	123		A122
FLASHING YELLOW ARROW																		A123
GREEN ARROW	127	127			118	118				133	133				124	124		

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



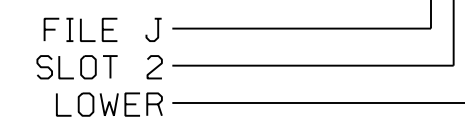
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

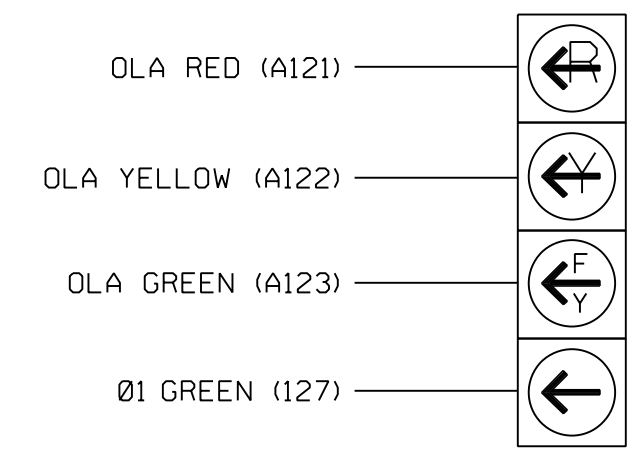
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
3A	TB4-5,6	I5U	58	20	3	3	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y		2.4	
8B	TB5-11,12	J6L	46	8	18	8	-	Y		2.4	
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

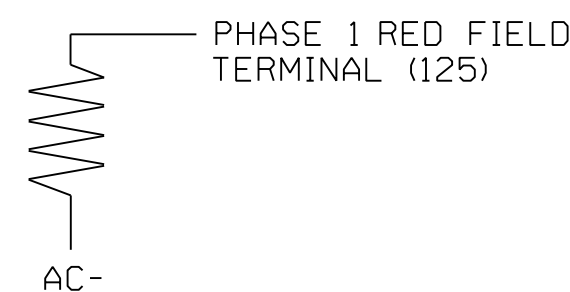


NOTE
 The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



SPECIAL DETECTOR NOTE

For zones 1A, 6A, 6B, 6C, and 6D install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPRARY DESIGN 4 - SHEET 1 OF 2

US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163

Division 11 ASHE COUNTY WEST JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS INIT. DATE

DocuSigned by: David J. Sears 2/7/2020

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS SEAL 044558

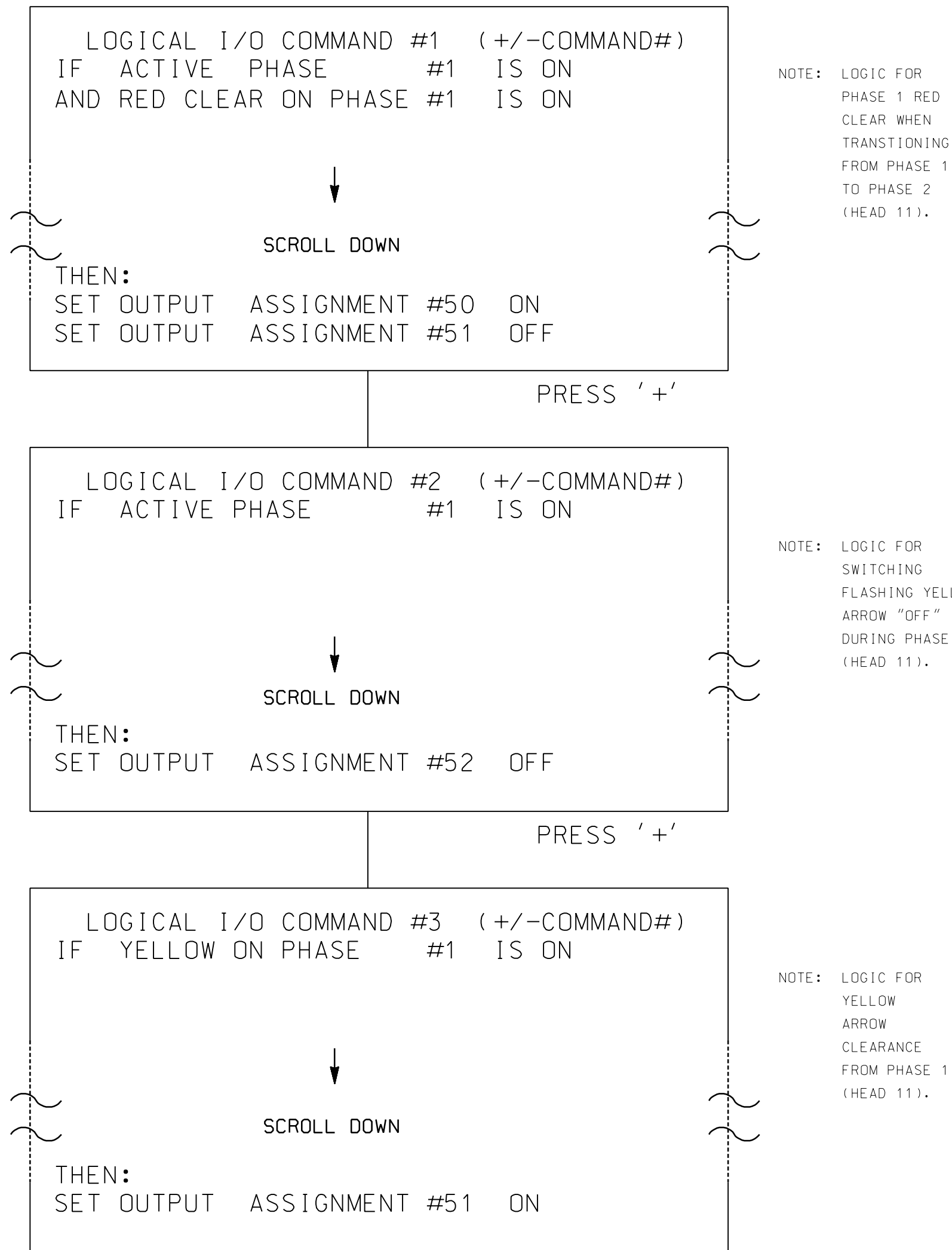
SIGNATURE DATE

SIG. INVENTORY NO. 11-0341T4

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  - RED  - YELLOW  - GREEN
FLASH COLORS:   - RED  - YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

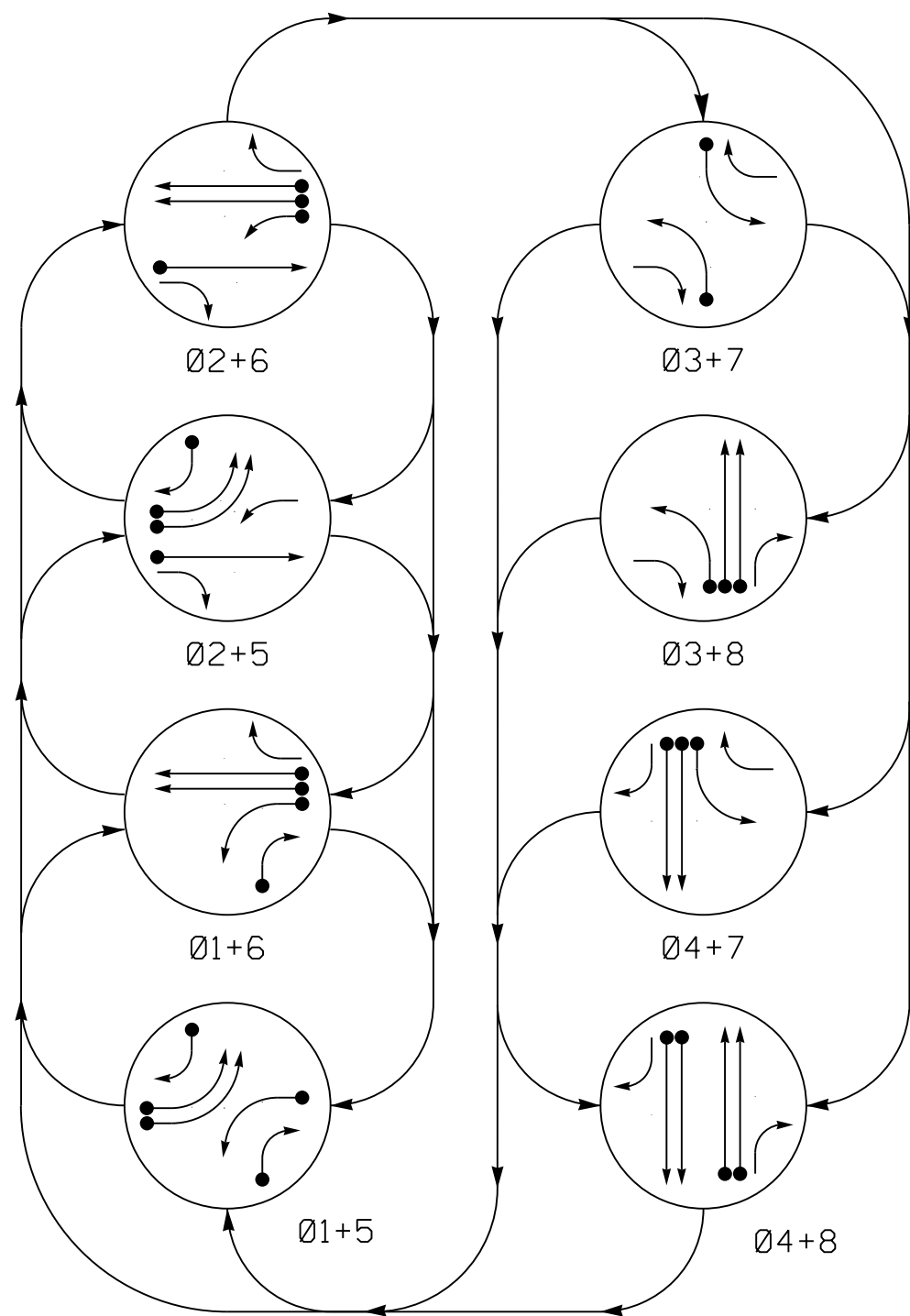
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341T4
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 4 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of: STATE OF NORTH CAROLINA Department of Transportation Office of Signal Management</p>	<p style="font-size: x-small;">US 221-NC 194 AT US 221 BUSINESS-NC 194/NC 163</p>	<p style="font-size: x-small;">SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS 044558</p>	<p style="font-size: x-small;">DIVISION 11 ASHE COUNTY WEST JEFFERSON</p> <p style="font-size: x-small;">PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS</p> <p style="font-size: x-small;">PREPARED BY: W.P. JONES REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> <p style="font-size: x-small;">DocuSigned by: <i>David T. Sears</i> 2/7/2020 SIGNATURE DATE</p>	REVISIONS	INIT.	DATE						
REVISIONS	INIT.	DATE										
<p>RK&K P: (919) 878-8560 8801 Six Forks Road Suite 700 Raleigh, North Carolina 27615-2965 NC License No. F-0112 www.rk.com Responsive People Creative Solutions</p>	<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SIG. INVENTORY NO. 11-0341T4</p>										

PHASING DIAGRAM



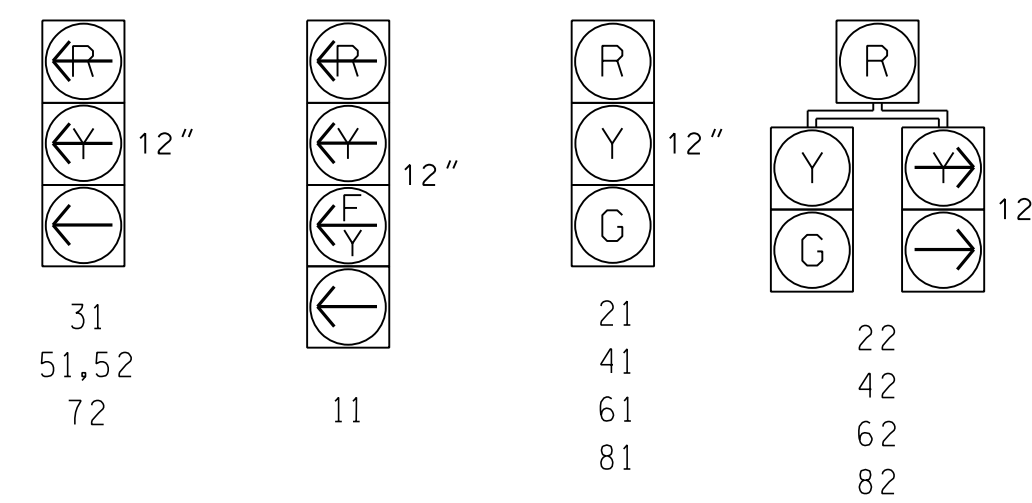
SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
72	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	R	G	G	R

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← ○ UNSIGNALIZED MOVEMENT
- ← ○ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



8 PHASE FULLY ACTUATED (ISOLATED)

US 221-NC 194 (Robert G. Barr Expressway)

US 221 Business-NC 194

US 221 (Robert G. Barr Expressway)

NC 163

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
- DISCONNECT EXISTING LOOP 2A AND RECONNECT EXISTING LOOP 2B.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	STRETCH TIME			DELAY TIME
1A	6X40	0	*	*	1	Y	Y	-	15	-	*
1B	6X40	0	2-4-2	-	1	Y	Y	-	-	-	*
2A	6X6	420	EXIST	-	DISCONNECTED						-
2B	6X6	420	EXIST	-	2	Y	Y	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-
5A	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-
5B	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-
5C	6X40	0	4-2-4	-	5	Y	Y	-	15	-	-
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	*
6B	6X6	420	*	*	6	Y	Y	-	2.2	-	*
6C	6X6	110	*	*	6	Y	Y	-	-	-	*
6D	6X6	110	*	*	6	Y	Y	-	-	-	*
7A	6X40	0	2-4-2	-	DISCONNECTED						-
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-
8A	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-
8B	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-
8C	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-
8D	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-

* Video Detection

OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	100	20	30	20	100	20	30
Yellow Clearance	3.0	5.5	3.0	3.8	3.0	5.5	3.0	4.1
Red Clearance	3.9	1.8	3.5	2.5	4.0	1.8	3.8	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	2.5	-	-	-	-	-	-
Max Variable Initial *	-	46	-	-	-	-	-	-
Time Before Reduction *	-	15	-	-	-	-	-	-
Time To Reduce *	-	45	-	-	-	-	-	-
Minimum Gap	-	3.4	-	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|--|---|--|--|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | Existing Modified Signal Head |
| | Proposed Sign | | Existing Sign |
| | Proposed Pedestrian Signal Head With Push Button & Sign | | Existing Pedestrian Signal Head |
| | Proposed Signal Pole with Guy | | Existing Signal Pole with Guy |
| | Proposed Signal Pole with Sidewalk Guy | | Existing Signal Pole with Sidewalk Guy |
| | Proposed Inductive Loop Detector | | Existing Inductive Loop Detector |
| | Proposed Controller & Cabinet | | Existing Controller & Cabinet |
| | Proposed Junction Box | | Existing Junction Box |
| | Proposed 2-in Underground Conduit | | Existing 2-in Underground Conduit |
| | Proposed Right of Way | | Existing Right of Way |
| | Proposed Directional Arrow | | Existing Directional Arrow |
| | Proposed Guardrail | | Existing Guardrail |
| | Proposed Metal Strain Pole | | Existing Metal Strain Pole |
| | Proposed Construction Zone Drums | | Existing Construction Zone Drums |
| | Proposed Video Detection Area | | Existing Video Detection Area |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE - TEMPORARY DESIGN 5 - CONSTRUCTION PHASE V

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Prepared for:
 Transportation Mobility and Safety Solutions
 UNIVERSITY OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 Signal Design Section
 750 N. Greenfield Parkway, Garner, NC 27529

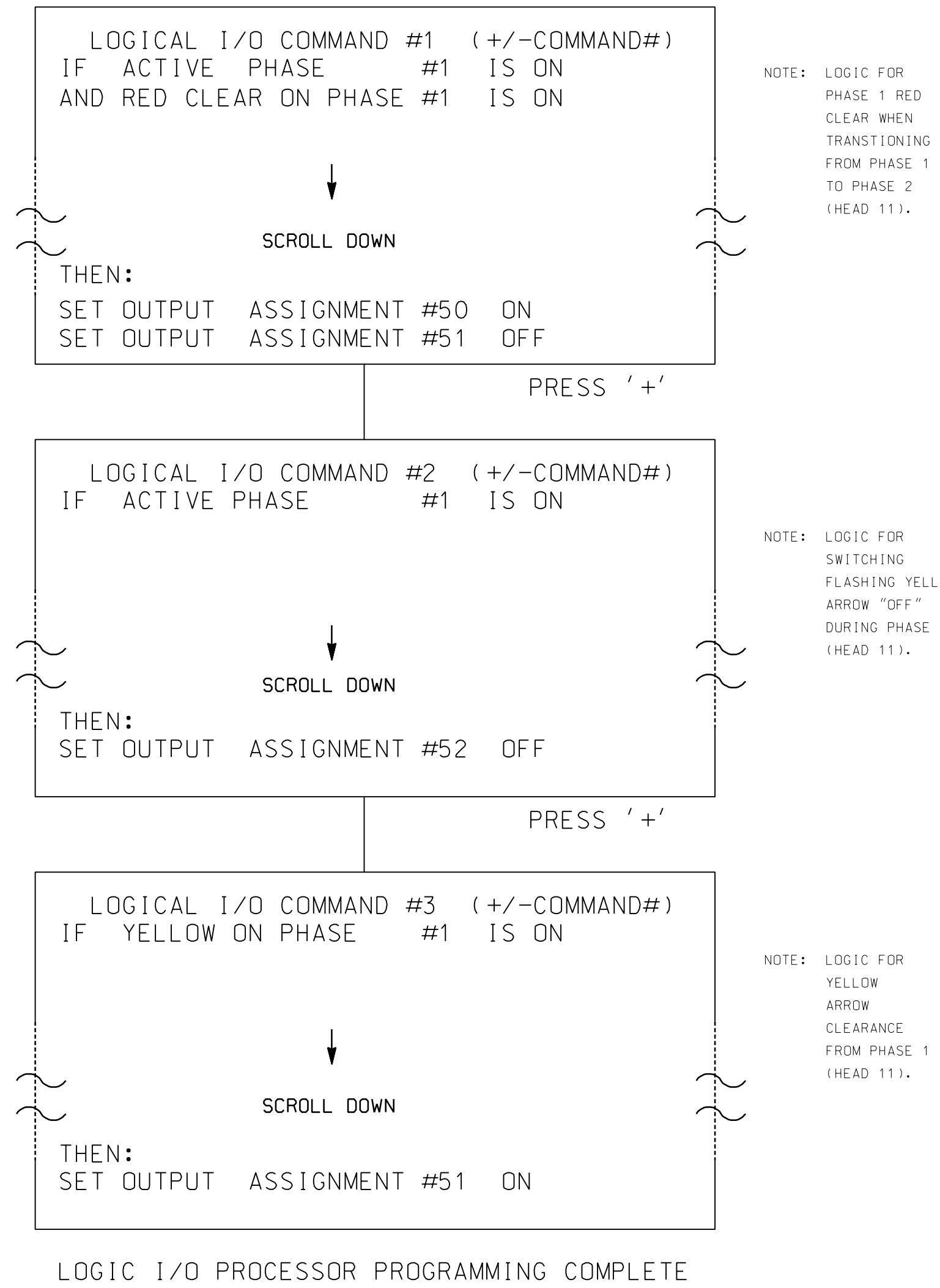
US 221-NC 194
 AT
 US 221 BUSINESS- NC 194/NC 163
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: INIT. DATE
 SCALE: 1" = 40'

SEAL
 NORTH CAROLINA
 PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-0341T5

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  _ RED  _ YELLOW  _ GREEN
FLASH COLORS:  _ RED  _ YELLOW  X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

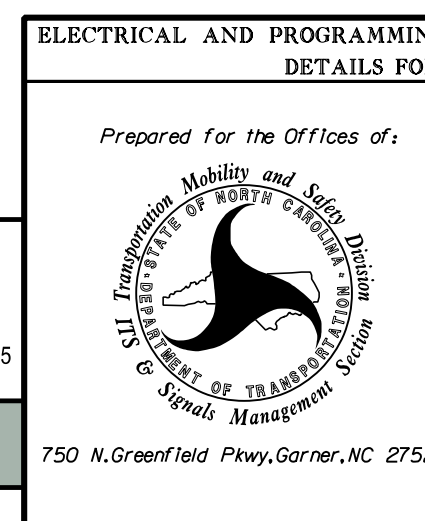
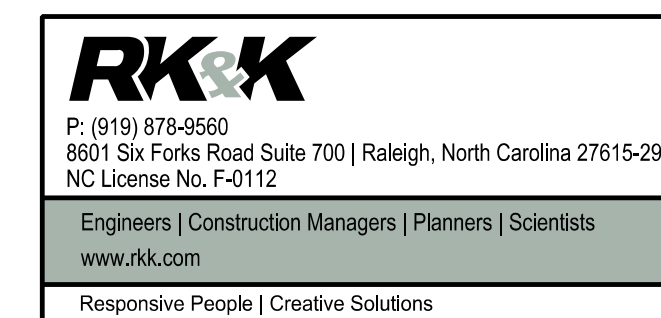
← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341T5
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 5 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



US 221-NC 194	
AT	
US 221 BUSINESS-NC 194/NC 163	
DIVISION 11	ASHE COUNTY WEST JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL

NORTH CAROLINA
PROFESSIONAL
ENGINEER
DAVID T. SEARS

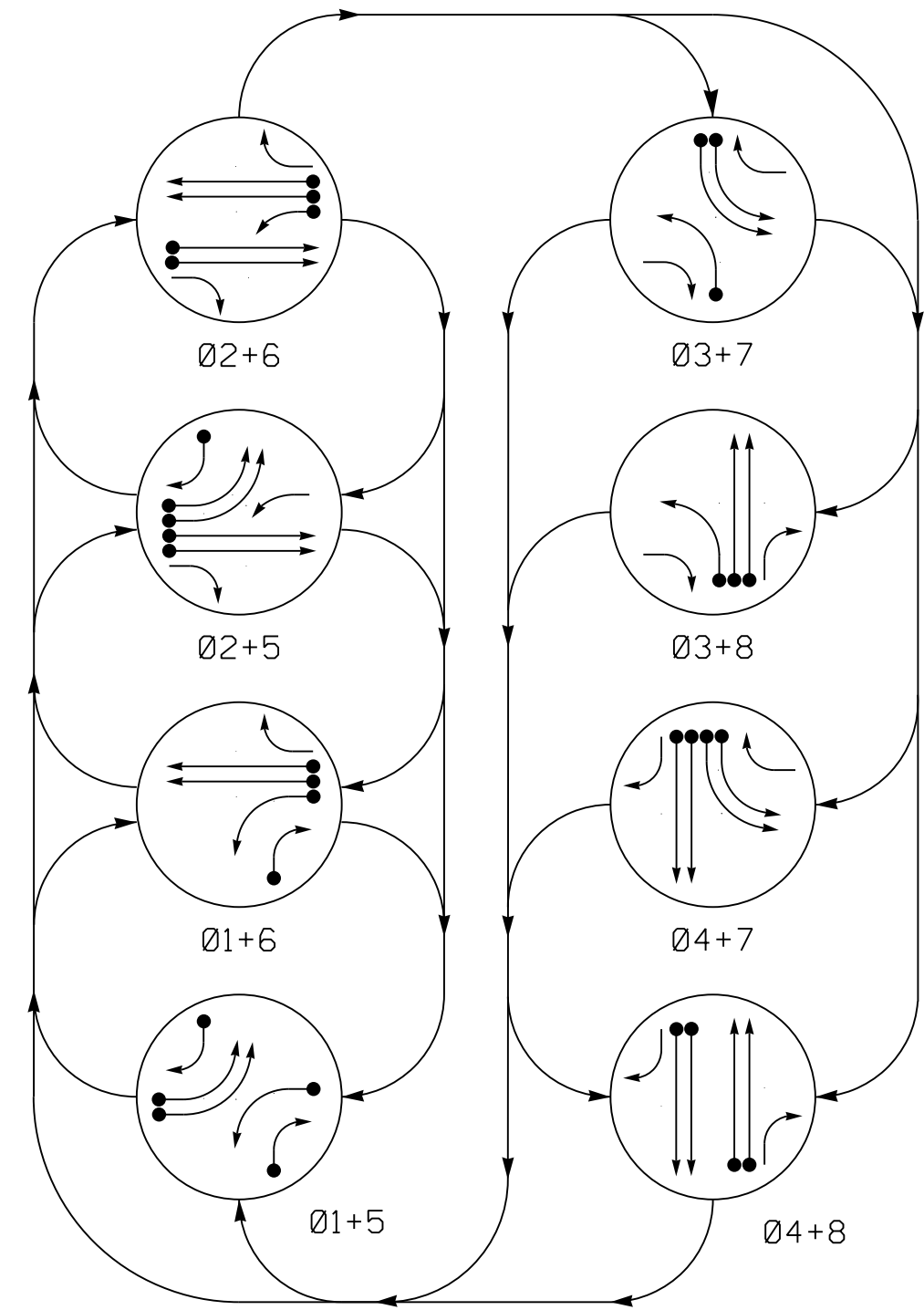
Seal 044558

DocuSigned by:
David T. Sears 2/7/2020

SIGNATURE DATE

SIG. INVENTORY NO. 11-0341T5

PHASING DIAGRAM



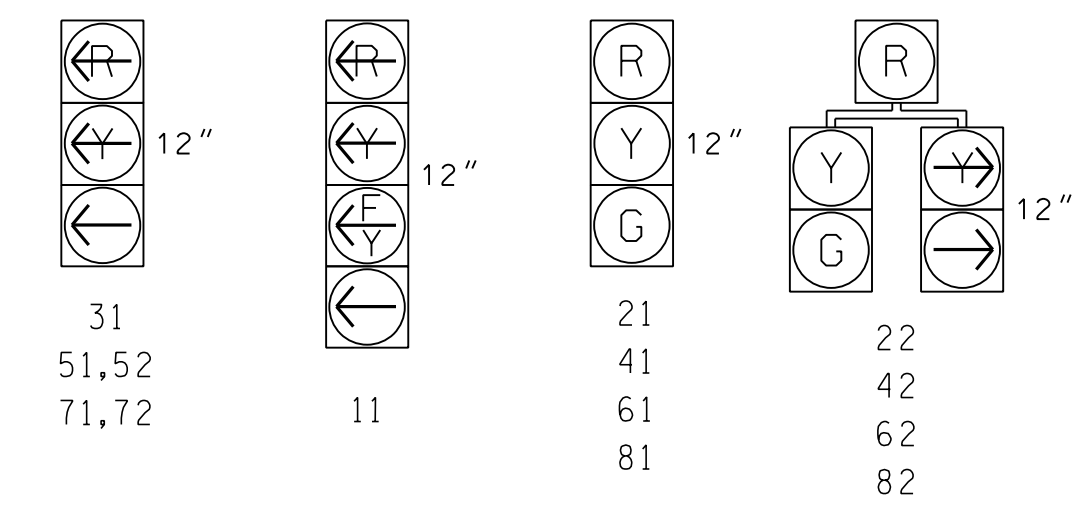
SIGNAL FACE	PHASE							
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø3+7	Ø3+8	Ø4+7	Ø4+8
11	←	←	←	←	←	←	←	←
21	R	R	G	G	R	R	R	Y
22	R	R	G	G	R	R	R	Y
31	←	←	←	←	←	←	←	←
41	R	R	R	R	R	R	G	G
42	R	R	R	R	R	R	G	G
51,52	←	←	←	←	←	←	←	←
61	R	G	R	G	R	R	R	Y
62	R	G	R	G	R	R	R	Y
71,72	←	←	←	←	←	←	←	←
81	R	R	R	R	R	G	G	R
82	R	R	R	R	R	G	G	R

PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



8 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.
- REPOSITION EXISTING SIGNAL HEAD NUMBERED 11.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	-
1B	6x40	0	2-4-2	-	1	Y	Y	-	-	15	-	-
2A	6X6	420	EXIST	-	2	Y	Y	-	-	-	-	-
2B	6X6	420	EXIST	-	2	Y	Y	-	-	-	-	-
3A	6X40	0	2-4-2	-	3	Y	Y	-	-	-	-	-
4A	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
4B	6X40	0	2-4-2	-	4	Y	Y	-	-	-	-	-
5A	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-	-
5B	6X40	0	4-2-4	-	5	Y	Y	-	-	-	-	-
5C	6X40	0	4-2-4	-	5	Y	Y	-	-	15	-	-
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	-
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	-
7A	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
7B	6X40	0	2-4-2	-	7	Y	Y	-	-	-	-	-
8A	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-	-
8B	6X6	300	EXIST	-	8	-	Y	-	2.4	-	-	-
8C	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-
8D	6X40	0	2-4-2	-	8	Y	Y	-	-	-	-	-

LEGEND

- | | |
|--|--|
| PROPOSED | EXISTING |
| ○ Traffic Signal Head | ● Traffic Signal Head |
| ○ Modified Signal Head | ○ N/A |
| ○ Sign | ○ Sign |
| ○ Pedestrian Signal Head With Push Button & Sign | ○ Pedestrian Signal Head With Push Button & Sign |
| ○ Signal Pole with Guy | ○ Signal Pole with Guy |
| ○ Signal Pole with Sidewalk Guy | ○ Signal Pole with Sidewalk Guy |
| □ Inductive Loop Detector | □ Inductive Loop Detector |
| □ Controller & Cabinet | □ Controller & Cabinet |
| □ Junction Box | □ Junction Box |
| ○ 2-in Underground Conduit | ○ 2-in Underground Conduit |
| → Right of Way | → Right of Way |
| → Directional Arrow | → Directional Arrow |
| → Guardrail | → Guardrail |
| ○ Metal Strain Pole | ○ Metal Strain Pole |

OASIS 2070 TIMING CHART

FEATURE	PHASE							
	1	2	3	4	5	6	7	8
Min Green 1 *	7	14	7	7	7	14	7	7
Extension 1 *	2.0	6.0	2.0	2.0	2.0	6.0	2.0	2.0
Max Green 1 *	20	100	20	30	20	100	20	30
Yellow Clearance	3.0	5.5	3.0	3.8	3.0	5.5	3.0	4.1
Red Clearance	3.8	1.8	3.5	2.5	4.0	1.8	3.8	1.9
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	-	1.5	-	-
Max Variable Initial *	-	46	-	-	-	46	-	-
Time Before Reduction *	-	15	-	-	-	15	-	-
Time To Reduce *	-	45	-	-	-	45	-	-
Minimum Gap	-	3.4	-	-	-	3.4	-	-
Recall Mode	-	MIN RECALL	-	-	-	MIN RECALL	-	-
Vehicle Call Memory	-	YELLOW	-	-	-	YELLOW	-	-
Dual Entry	-	-	-	-	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

SIGNAL UPGRADE - FINAL DESIGN

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 UNIVERSITY OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION
 750 N. Greenfield Pkwy, Garner, NC 27529

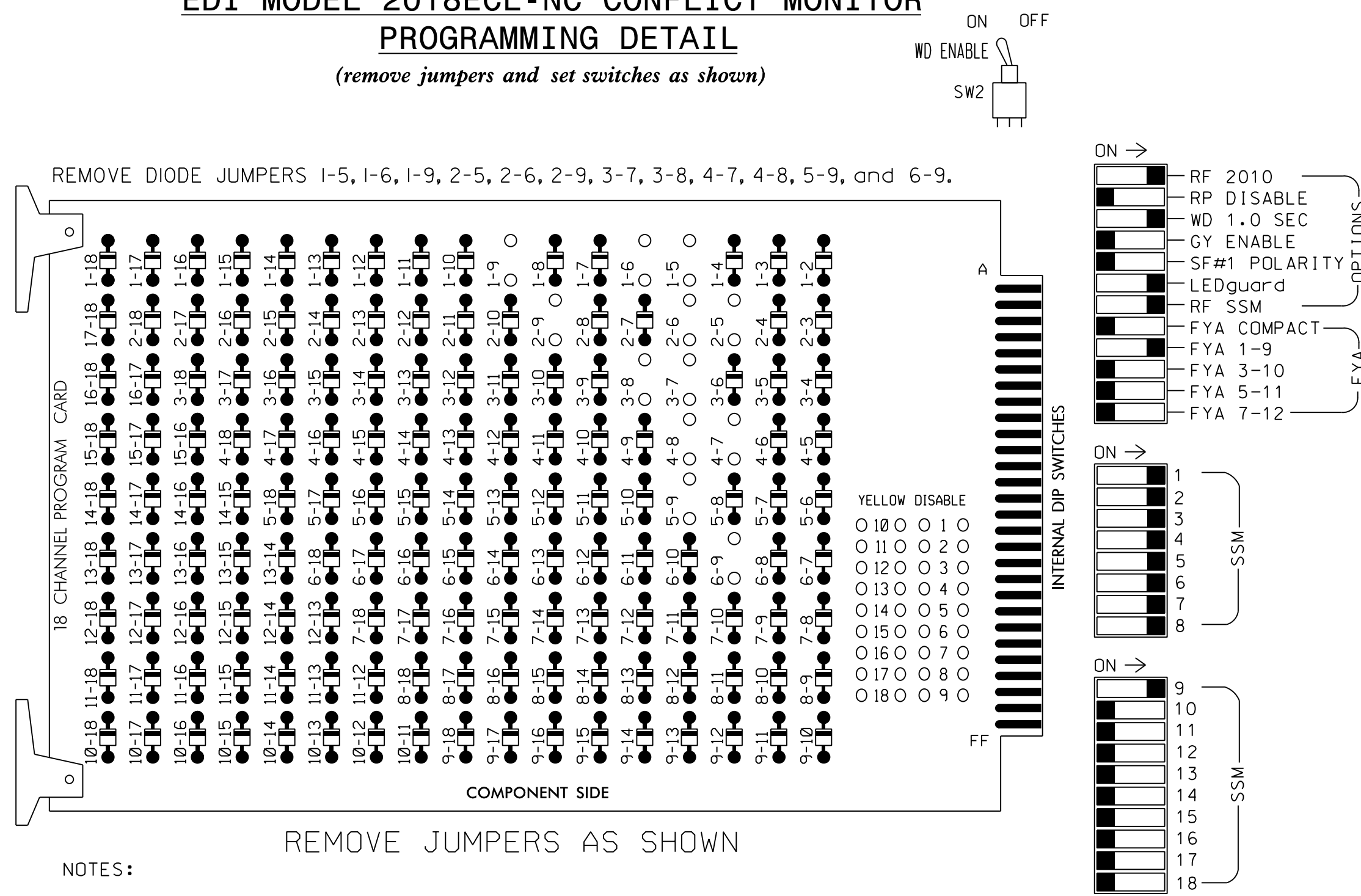
US 221-NC 194
 AT
 US 221 BUSINESS- NC 194/NC 163
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS INIT. DATE
 SCALE 0 40
 1" = 40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 DocuSigned by:
 David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 11-0341

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S4,S5,S7,S8,S10,S11,AUX S1
 PHASES USED.....1,2,3,4,5,6,7,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

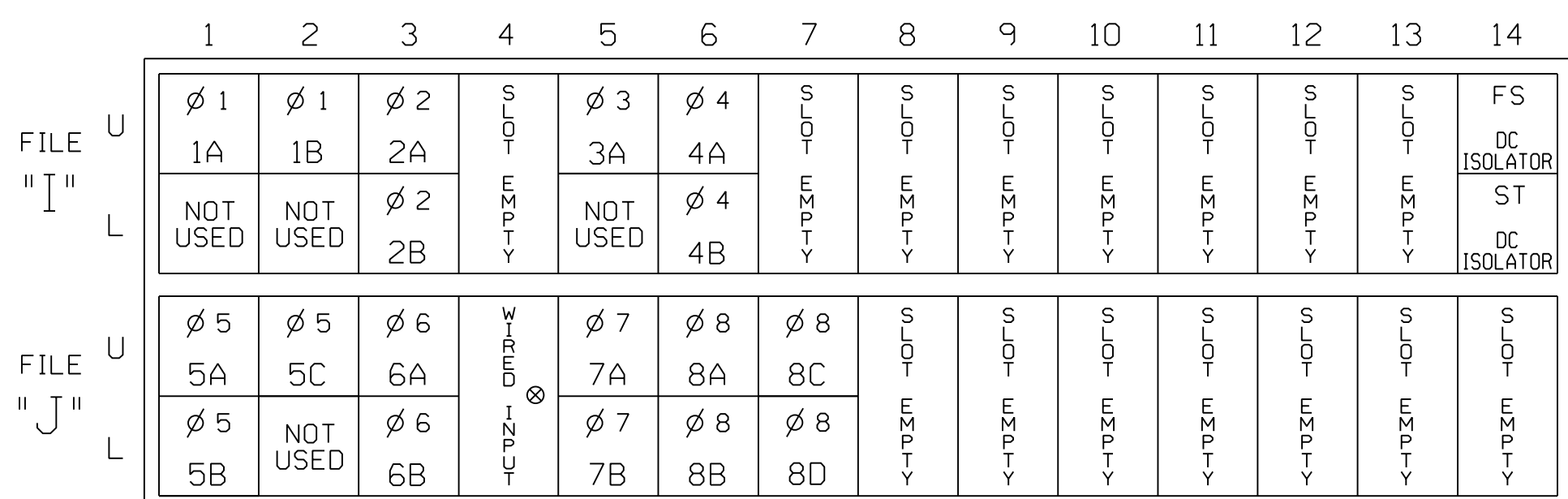
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CHU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	22	31	41,42	42	51,52	61,62	62	71,72	81,82	11	11	11	11	11	11
RED	*	128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW					116			131			122							A121
YELLOW ARROW		126		117	117			132	132		123	123						A122
FLASHING YELLOW ARROW																		A123
GREEN ARROW	127	127		118	118			133	133		124	124						

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 * See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

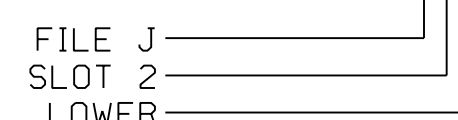


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB21-1,2	J1U	56	18	1	1	Y	Y			15
1B	TB2-5,6	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-9,10	J3U	63	25	32	2	Y	Y			
2B	TB2-11,12	J3L	76	38	42	2	Y	Y			
3A	TB4-5,6	J5U	58	20	3	3	Y	Y			
4A	TB4-9,10	J6U	41	3	4	4	Y	Y			
4B	TB4-11,12	J6L	45	7	14	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
5B	TB3-3,4	J1L	55	17	5	5	Y	Y			
5C	TB3-5,6	J2U	40	2	6	5	Y	Y			15
6A	TB3-9,10	J3U	64	26	36	6	Y	Y			
6B	TB3-11,12	J3L	77	39	46	6	Y	Y			
7A	TB5-5,6	J5U	57	19	7	7	Y	Y			
7B	TB5-7,8	J5L	57	19	7	7	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	-	Y		2.4	
8B	TB5-11,12	J6L	46	8	18	8	-	Y		2.4	
8C	TB7-1,2	J7U	66	28	38	8	Y	Y			
8D	TB7-3,4	J7L	79	41	48	8	Y	Y			

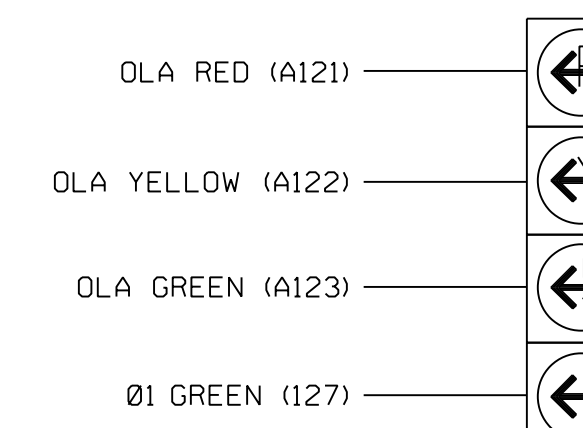
¹Add jumper from J1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

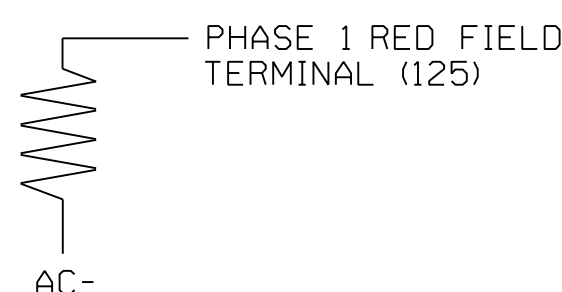


NOTE
 The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

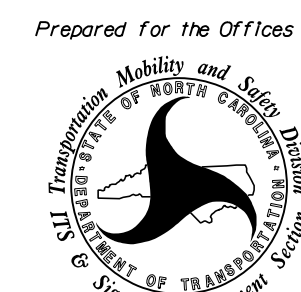
(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



ELECTRICAL DETAIL - FINAL DESIGN - SHEET 1 OF 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

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DIVISION 11 ASHE COUNTY WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS
 PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

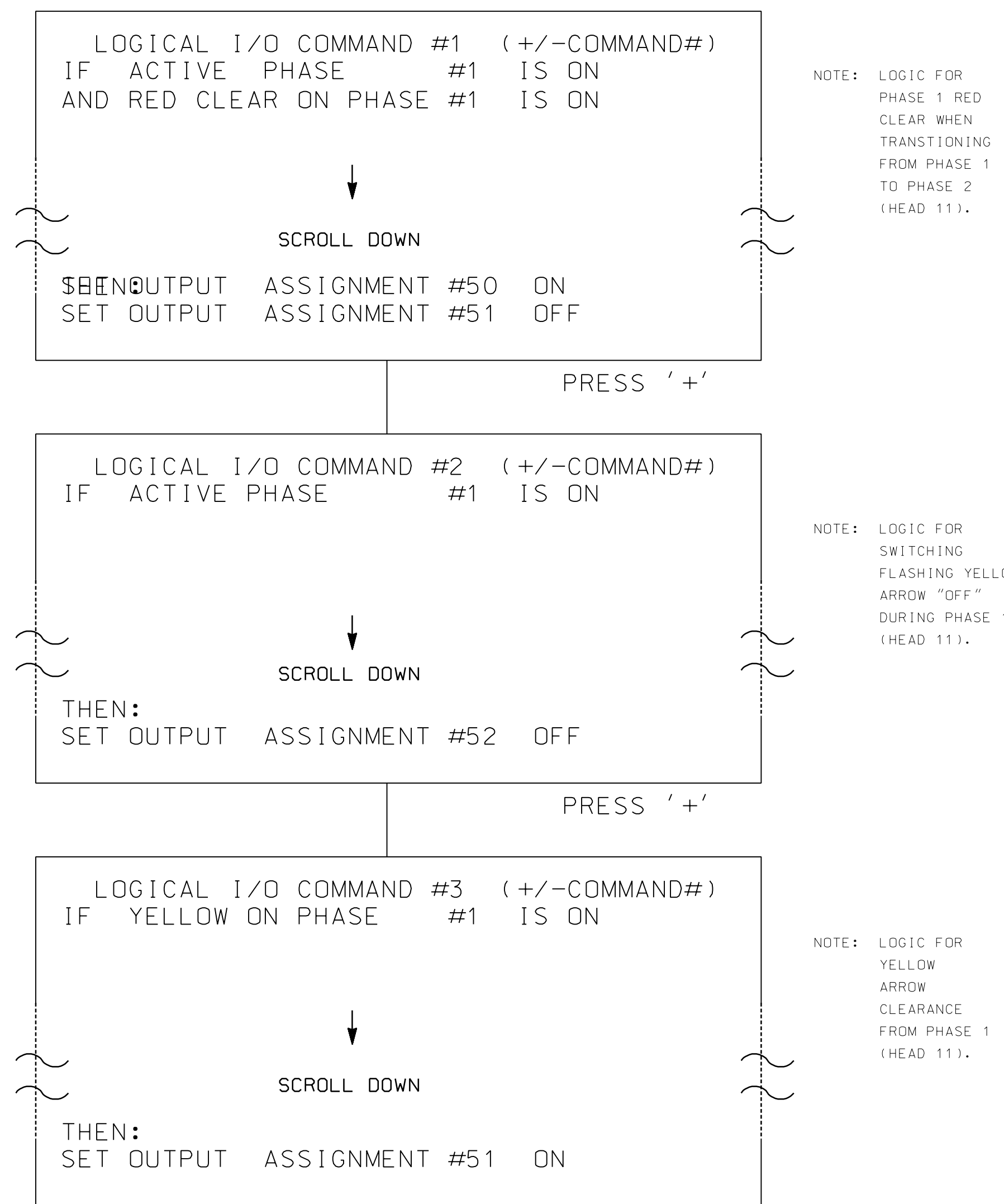
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 SEAL 044558
 DAVID T. SEARS
 DocuSigned by:
 David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 11-0341

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE
OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: - RED - YELLOW - GREEN
FLASH COLORS: - RED - YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0.0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0341
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - FINAL DESIGN - SHEET 2 OF 2

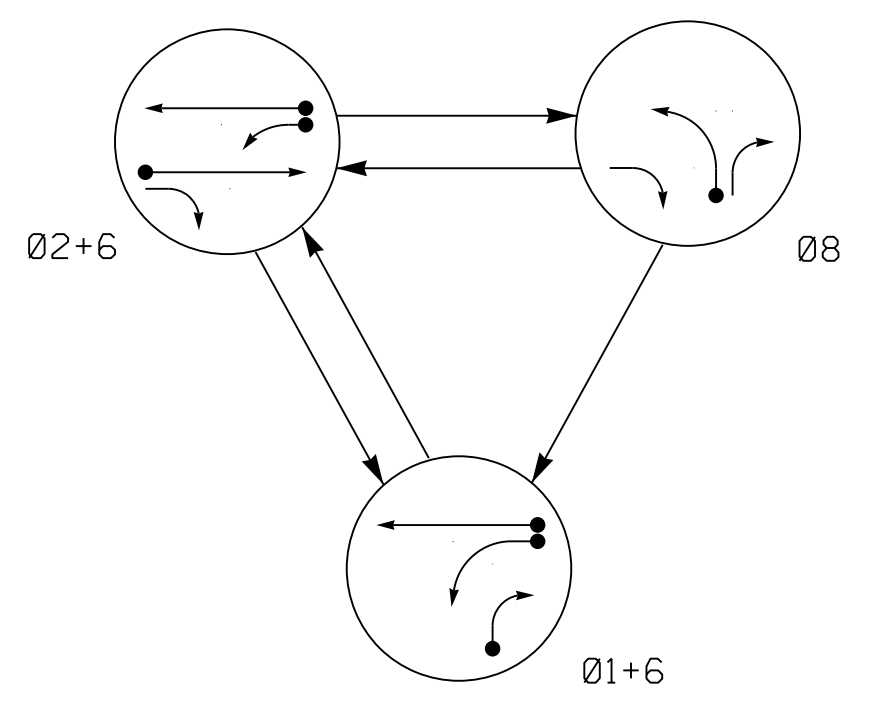
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<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of:</p> <p style="font-size: x-small;">750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p style="font-size: large; font-weight: bold;">US 221-NC 194</p> <p style="font-size: large;">at</p> <p style="font-size: large; font-weight: bold;">US 221 Business-NC 194/NC 163</p> <p style="font-size: x-small;">DIVISION 11 ASHE COUNTY WEST JEFFERSON</p> <p style="font-size: x-small;">PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS</p> <p style="font-size: x-small;">PREPARED BY: W.P. JONES REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <i>David T. Sears</i> 2/7/2020</p> <p style="font-size: x-small;">SIGNATURE DATE</p> <p style="font-size: x-small;">SIG. INVENTORY NO. 11-0341</p>
REVISIONS	INIT.	DATE												

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PHASING DIAGRAM

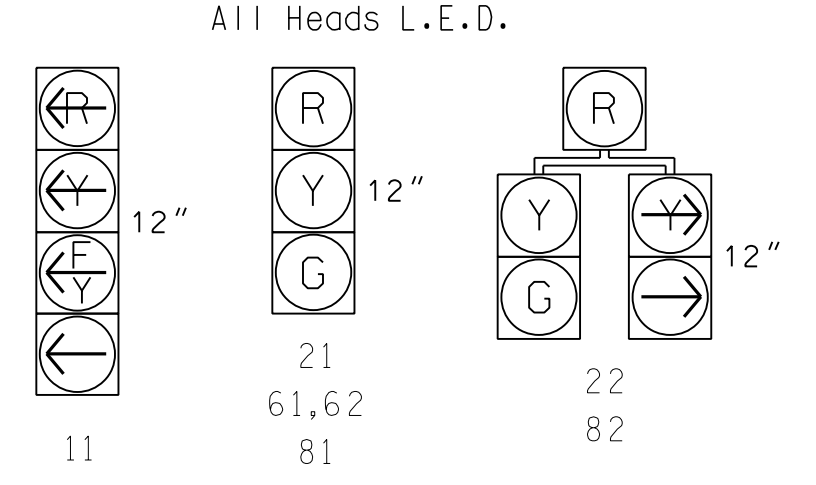


PHASING DIAGRAM DETECTION LEGEND

- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 8	FLASH
11	Y	R	Y	Y
21	R	G	R	Y
22	R	G	R	Y
61,62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R

SIGNAL FACE I.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

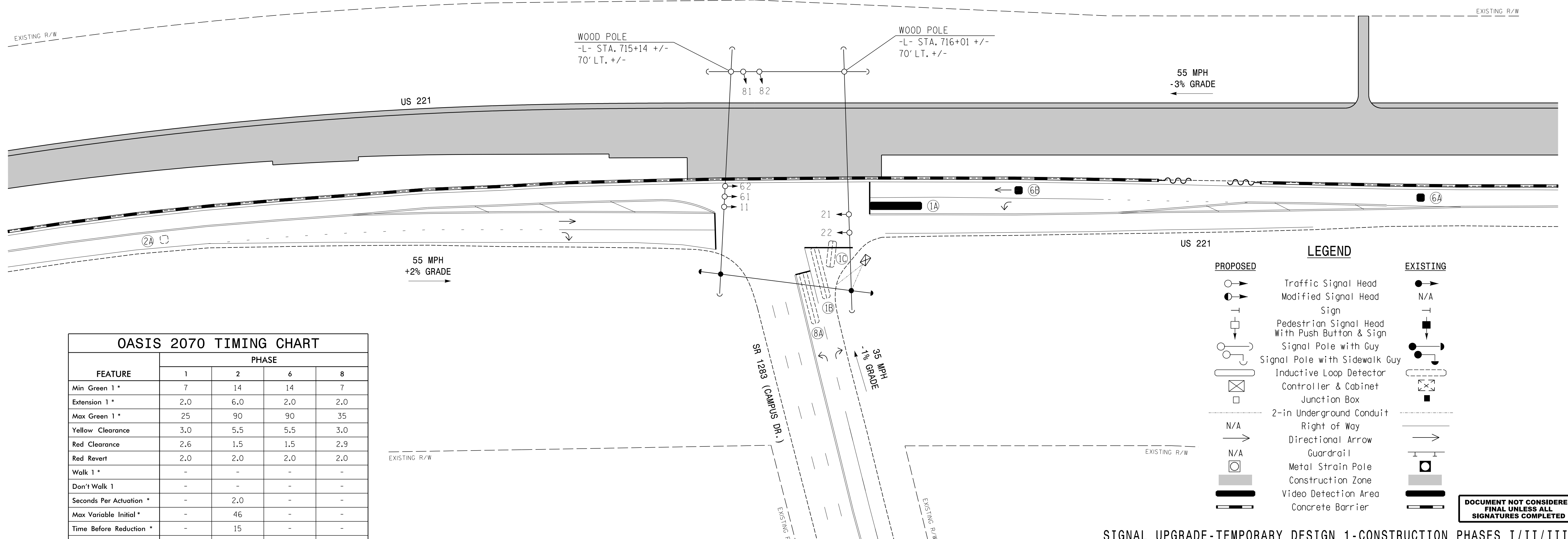
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	DETECTOR PROGRAMMING								
				NEW LOOP	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
1A	6X40	0	*	*	1	Y	Y	-	-	15	-	*
1B/1C	6X40/6X20	0	2-4-2	-	1	Y	Y	-	-	15	-	Y
2A	6X6	420	EXIST	-	2	Y	Y	-	-	-	-	Y
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	-	*
6B	6X6	110	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	0	EXIST	-	8	Y	Y	-	-	3	-	Y

* Video Detection

3 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 MAY BE LAGGED.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- LOCATE NEW CABINET SO AS NOT TO OBSTRUCT SIGHT DISTANCE OF VEHICLES TURNING RIGHT ON RED.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	14	14	7
Extension 1 *	2.0	6.0	2.0	2.0
Max Green 1 *	25	90	90	35
Yellow Clearance	3.0	5.5	5.5	3.0
Red Clearance	2.6	1.5	1.5	2.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	2.0	-	-
Max Variable Initial *	-	46	-	-
Time Before Reduction *	-	15	-	-
Time To Reduce *	-	30	-	-
Minimum Gap	-	3.4	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED	LEGEND	EXISTING
○	Traffic Signal Head	●
○	Modified Signal Head	N/A
○	Sign	N/A
○	Pedestrian Signal Head With Push Button & Sign	○
○	Signal Pole with Guy	○
○	Signal Pole with Sidewalk Guy	○
□	Inductive Loop Detector	□
□	Controller & Cabinet	□
□	Junction Box	□
□	2-in Underground Conduit	□
N/A	Right of Way	---
N/A	Directional Arrow	→
N/A	Guardrail	---
○	Metal Strain Pole	○
█	Construction Zone	█
█	Video Detection Area	█
█	Concrete Barrier	█

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SIGNAL UPGRADE-TEMPORARY DESIGN 1-CONSTRUCTION PHASES I/II/III

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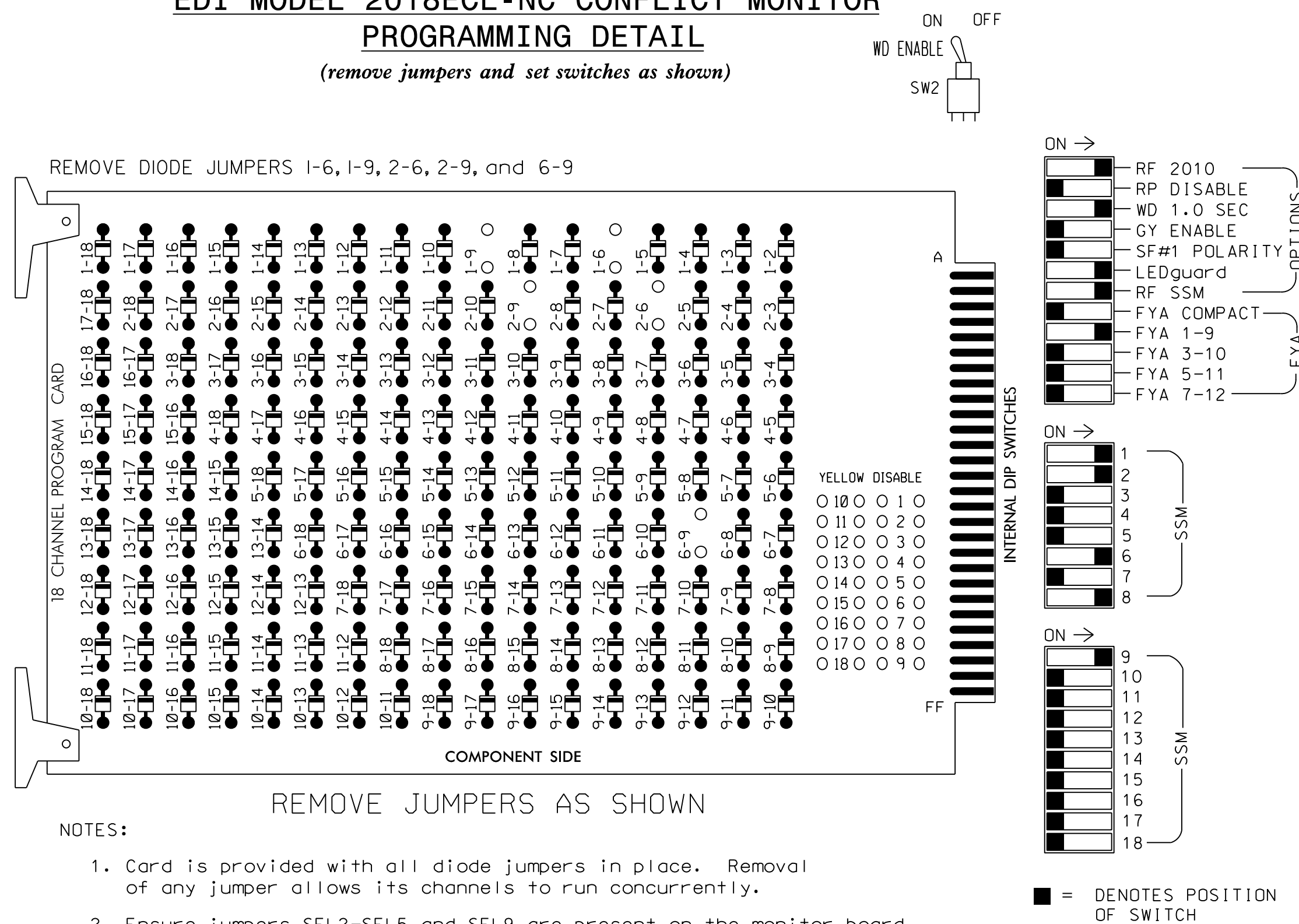
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 Transportation Mobility and Safety Division
 DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

US 221 AT SR 1283 (CAMPUS DR.)
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: _____ INIT. DATE

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 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 DocuSigned by:
 David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-125011

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phase 2 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1
 PHASES USED.....1,2,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
DMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	NU	NU	NU	NU	61,62	NU	NU	22	81,82	NU	11	NU	NU	NU	NU
RED	*	128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW	126										108		A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	127									109							

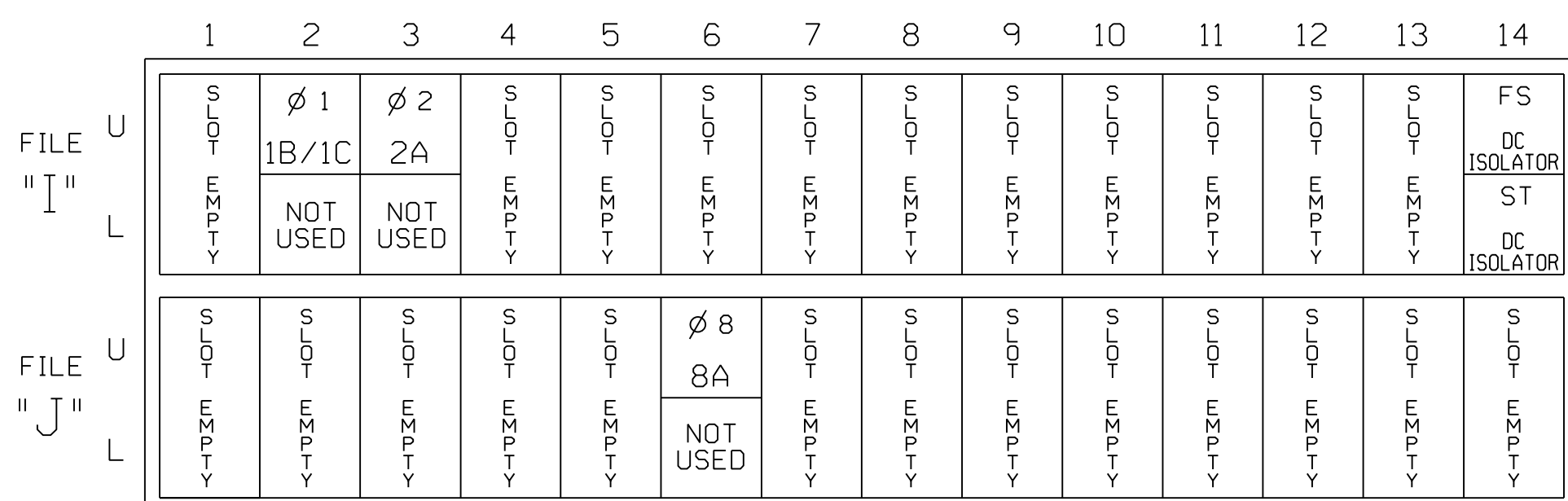
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



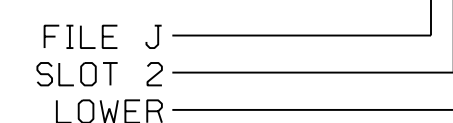
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

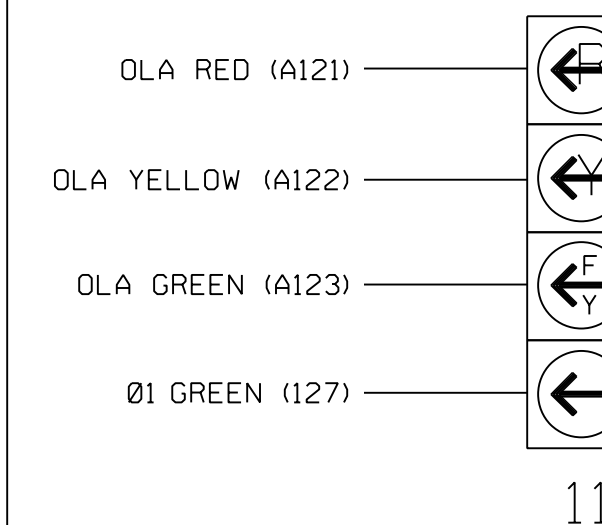
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1B/1C	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

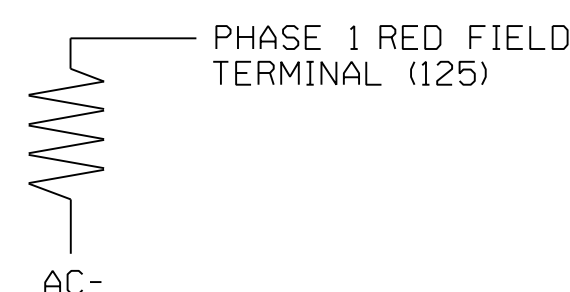


NOTE
 The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



SPECIAL DETECTOR NOTE

For zones 1A, 6A, and 6B install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPORARY DESIGN 1 - SHEET 1 OF 2

US 221 AT SR 1283 (CAMPUS DR.)

ASHE COUNTY WEST JEFFERSON

PREPARED BY: W.P. JONES REVIEWED BY: D. SEARS

DATE: FEBRUARY 2020

REVISIONS: _____ INIT. DATE

DocuSigned by: David J. Sears 2/7/2020

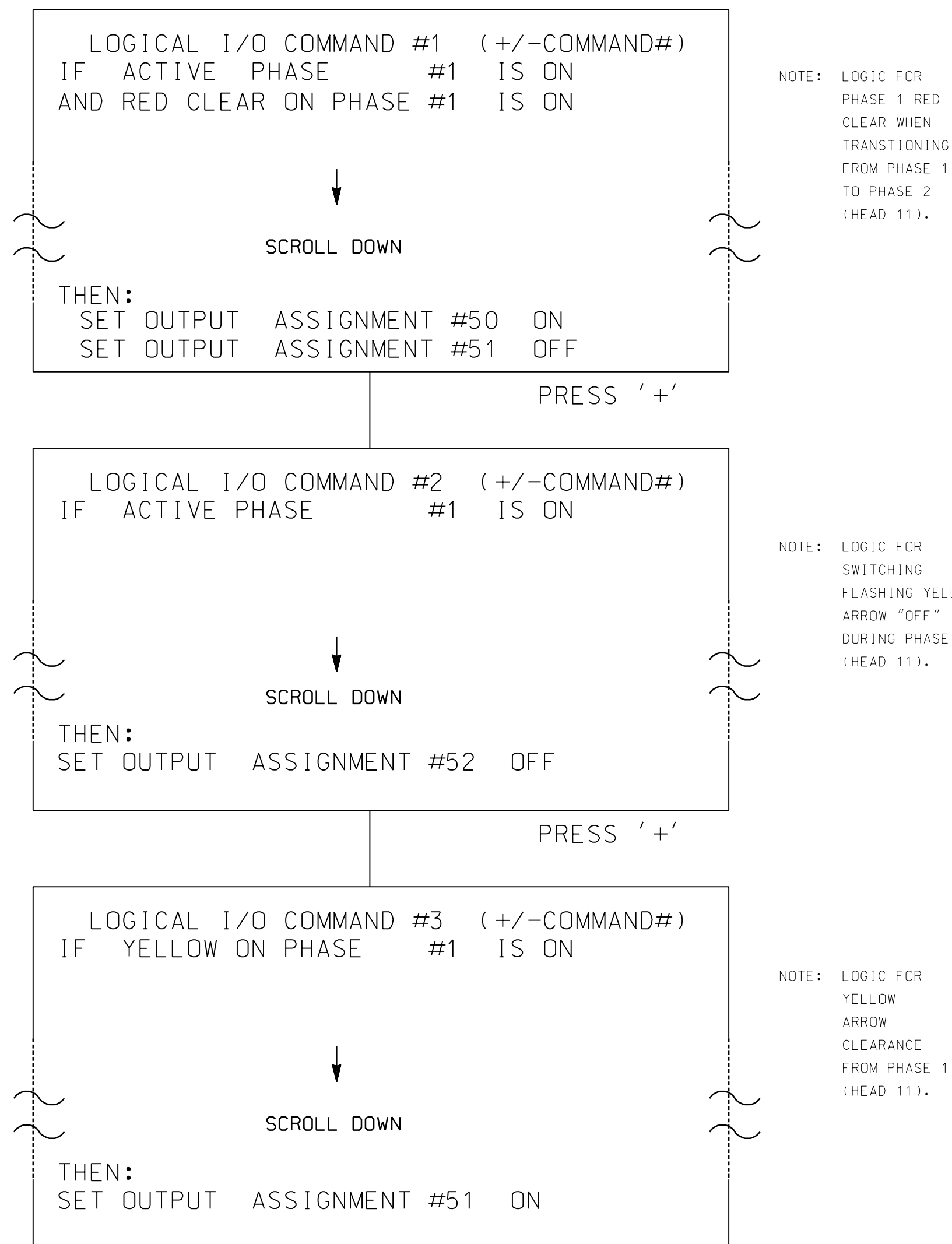
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS SEAL 044558

SIG. INVENTORY NO. 11-125011

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

1. FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
2. FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:      |12345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR:  | _ RED _ YELLOW _ GREEN
FLASH COLORS:   | _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1250T1
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 1 - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

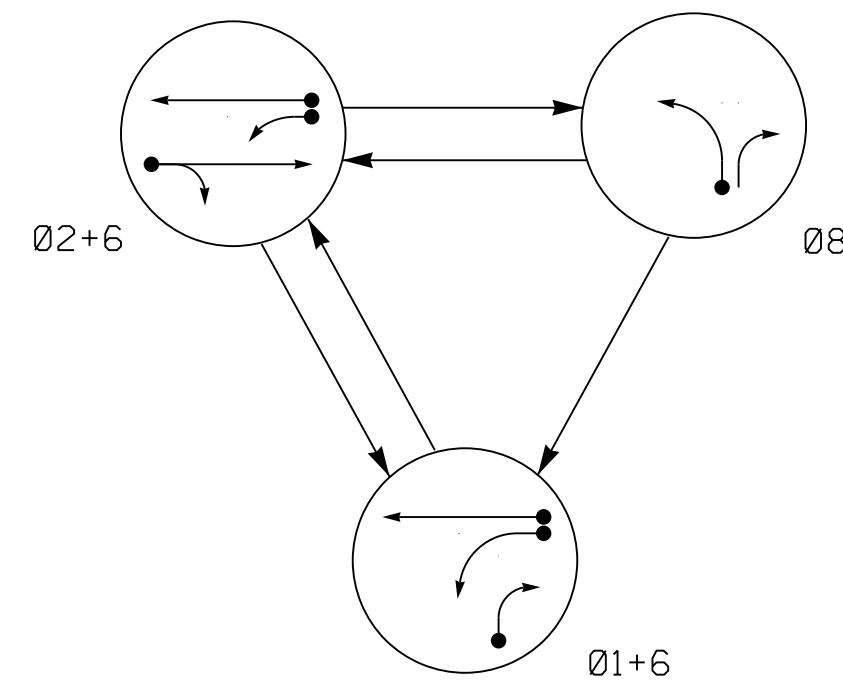
<p style="font-size: x-small;">ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p style="font-size: x-small;">Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>US 221 AT SR 1283 (CAMPUS DR.)</p> <p style="font-size: x-small;">DIVISION 11 ASHE COUNTY WEST JEFFERSON</p> <p style="font-size: x-small;">PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS</p> <p style="font-size: x-small;">PREPARED BY: W.P. JONES REVIEWED BY:</p> <table border="1" style="width: 100%; border-collapse: collapse; font-size: x-small;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE							<p style="font-size: x-small;">SEAL</p> <p style="font-size: x-small;">DocuSigned by: <i>David T. Sears</i> 2/7/2020</p> <p style="font-size: x-small;">SIGNATURE DATE</p>	<p>SIG. INVENTORY NO. 11-1250T1</p>
REVISIONS	INIT.	DATE										

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PHASING DIAGRAM

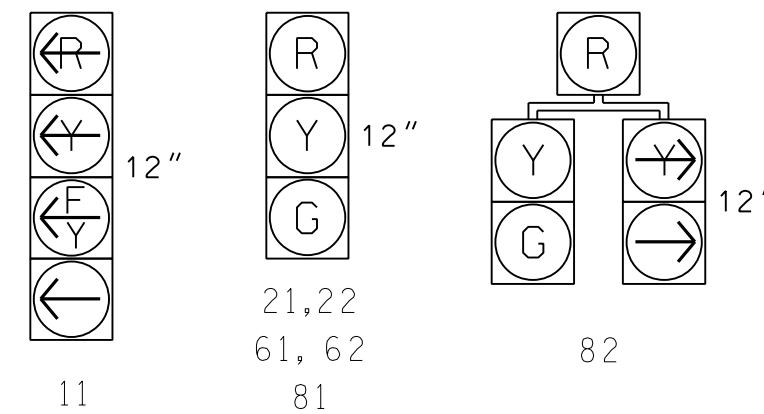


PHASING DIAGRAM DETECTION LEGEND
 ● DETECTED MOVEMENT
 ○ UNDETECTED MOVEMENT (OVERLAP)
 ○ UNSIGNALIZED MOVEMENT
 ○ PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 8	FLASH
11	Y	R	Y	Y
21,22	R	G	R	Y
61,62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



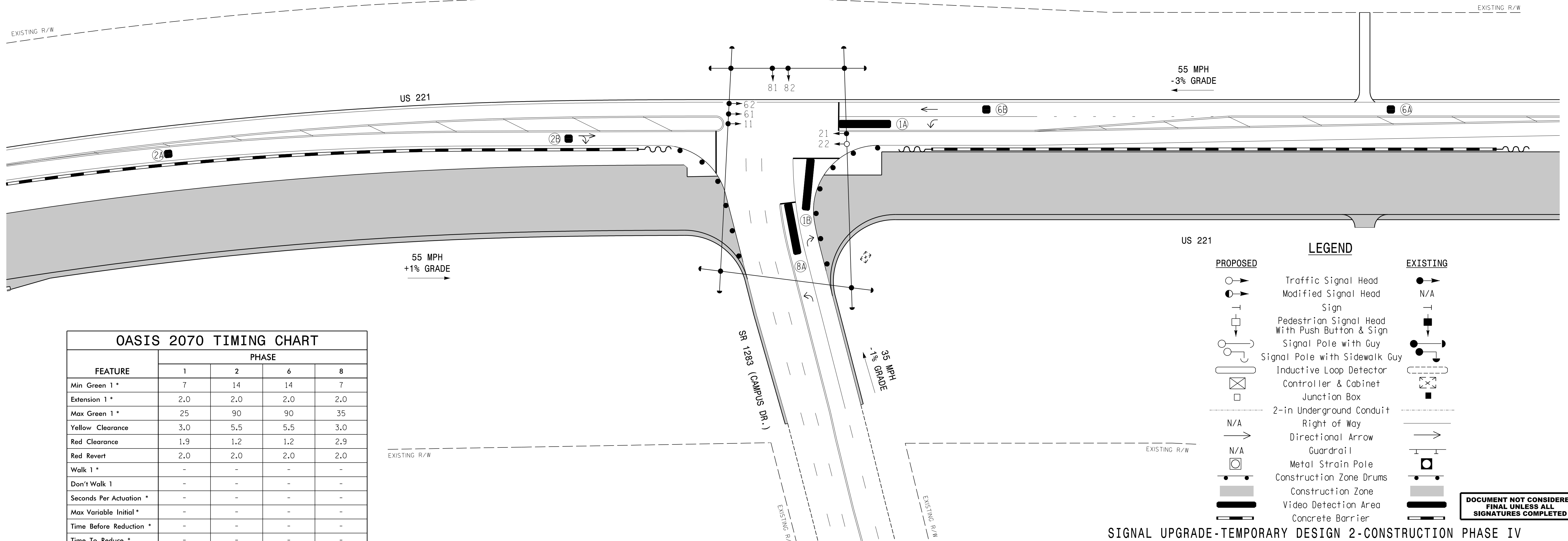
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART												
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Y	Y	-	-	15	-	*
1B	6X40	0	*	*	1	Y	Y	-	-	15	-	*
2A	6X6	420	*	*	2	Y	Y	-	2.2	-	-	*
2B	6X6	110	*	*	2	Y	Y	-	-	-	-	*
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	-	*
6B	6X6	110	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	0	*	*	8	Y	Y	-	-	3	-	*

* Video Detection

3 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 MAY BE LAGGED.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 11, 21, 61, 62, 81, AND 82.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	14	14	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	25	90	90	35
Yellow Clearance	3.0	5.5	5.5	3.0
Red Clearance	1.9	1.2	1.2	2.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND		
PROPOSED		EXISTING
○	Traffic Signal Head	●
○	Modified Signal Head	N/A
○	Sign	N/A
○	Pedestrian Signal Head With Push Button & Sign	○
○	Signal Pole with Guy	○
○	Signal Pole with Sidewalk Guy	○
□	Inductive Loop Detector	□
□	Controller & Cabinet	□
□	Junction Box	□
□	2-in Underground Conduit	□
N/A	Right of Way	---
N/A	Directional Arrow	→
N/A	Guardrail	— — — —
○	Metal Strain Pole	○
○	Construction Zone Drums	○
■	Construction Zone	■
■	Video Detection Area	■
■	Concrete Barrier	■

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE-TEMPORARY DESIGN 2-CONSTRUCTION PHASE IV

Prepared for:

US 221
 AT
 SR 1283 (CAMPUS DR.)

DIVISION 11 ASHE CO. WEST JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN

PREPARED BY: DTSEARS REVIEWED BY:

SEAL

DocuSigned by:
 David T. Sears 2/7/2020

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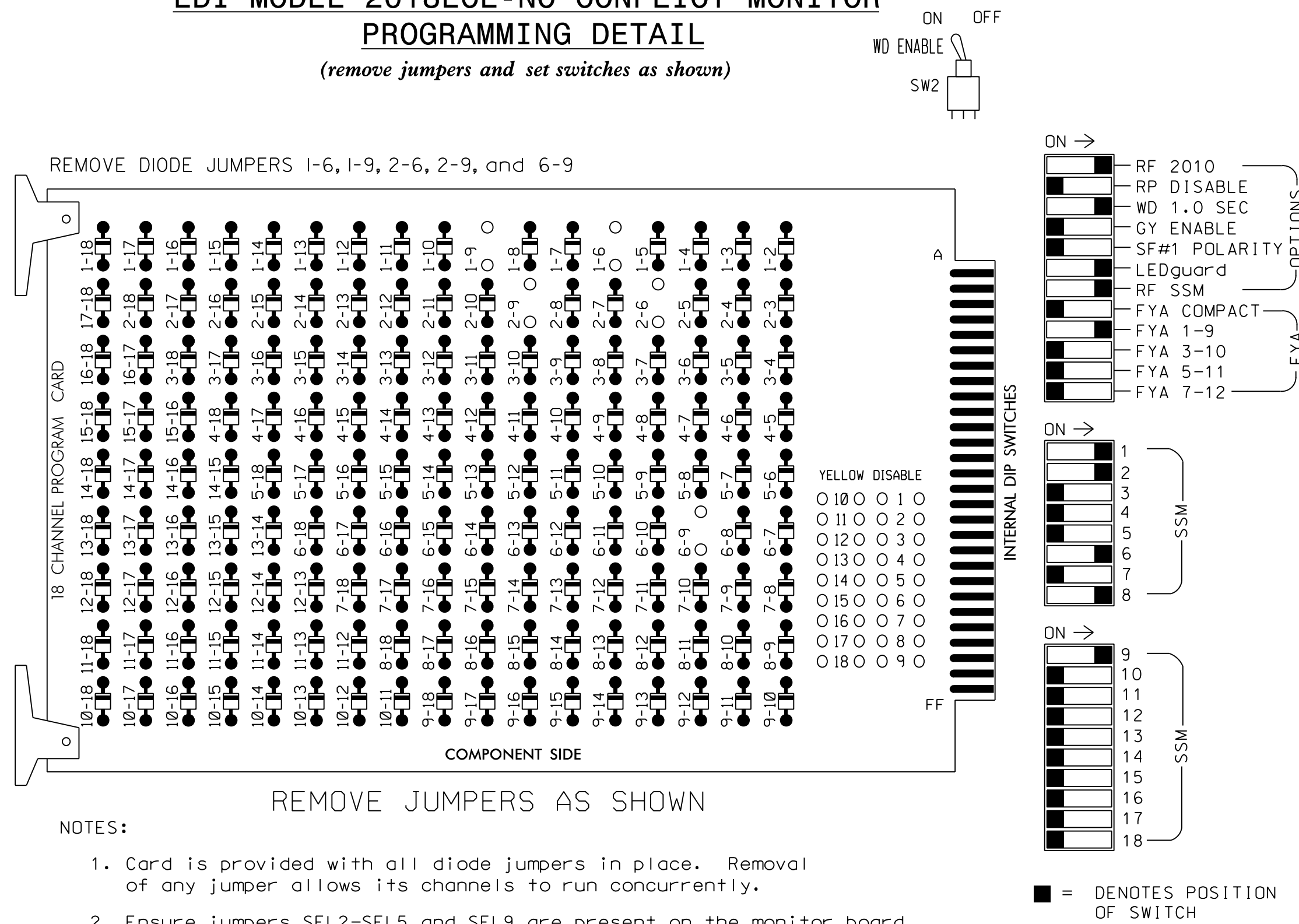
750 N. Greenfield Pkwy, Garner, NC 27529

SCALE
 0 40
 1" = 40'

REVISIONS	INIT.	DATE

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S8,S11,AUX S1
 PHASES USED.....1,2,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	82	21,22	NU	NU	NU	NU	61,62	NU	NU	81,82	NU	11★	NU	NU	NU	NU	NU
RED	*	128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW													A121					
YELLOW ARROW	126												A122					
FLASHING YELLOW ARROW													A123					
GREEN ARROW	127	127																

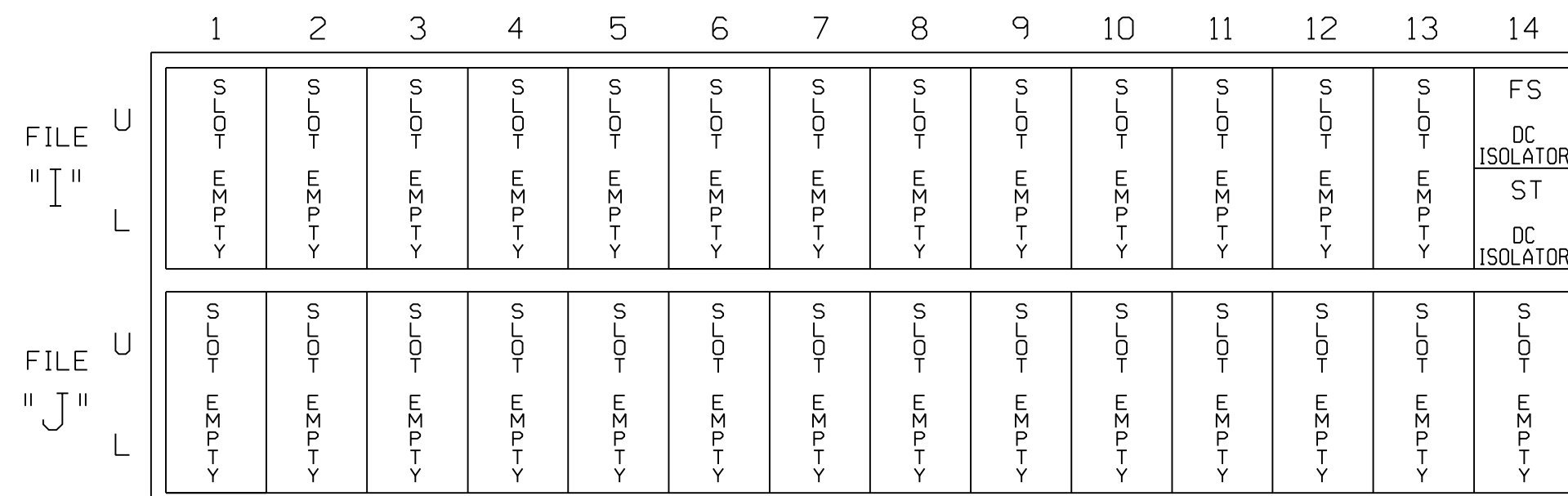
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

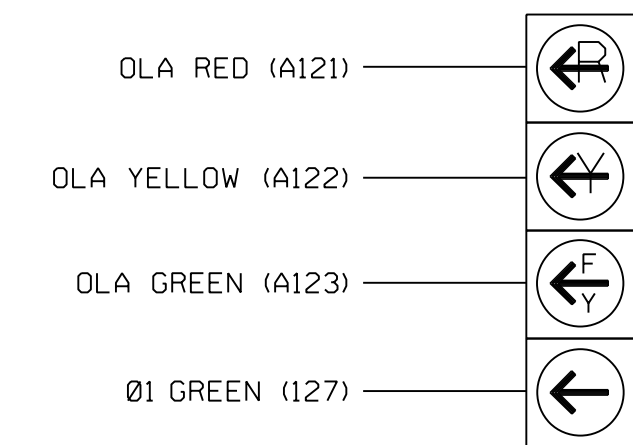


EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



11

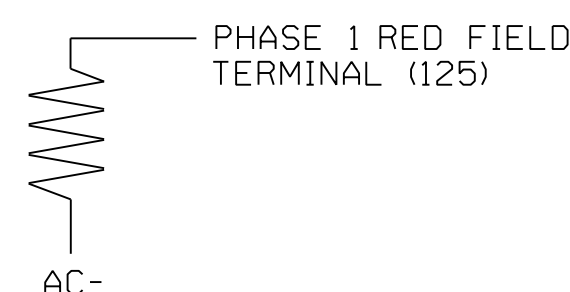
NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



SPECIAL DETECTOR NOTE

For zones 1A, 1B, 2A, 2B, 6A, 6B, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.



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ELECTRICAL DETAIL - TEMPORARY DESIGN 2 - SHEET 1 OF 2

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Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 221
 AT
 SR 1283 (CAMPUS DR.)

DIVISION 11 ASHE COUNTY WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS
 PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

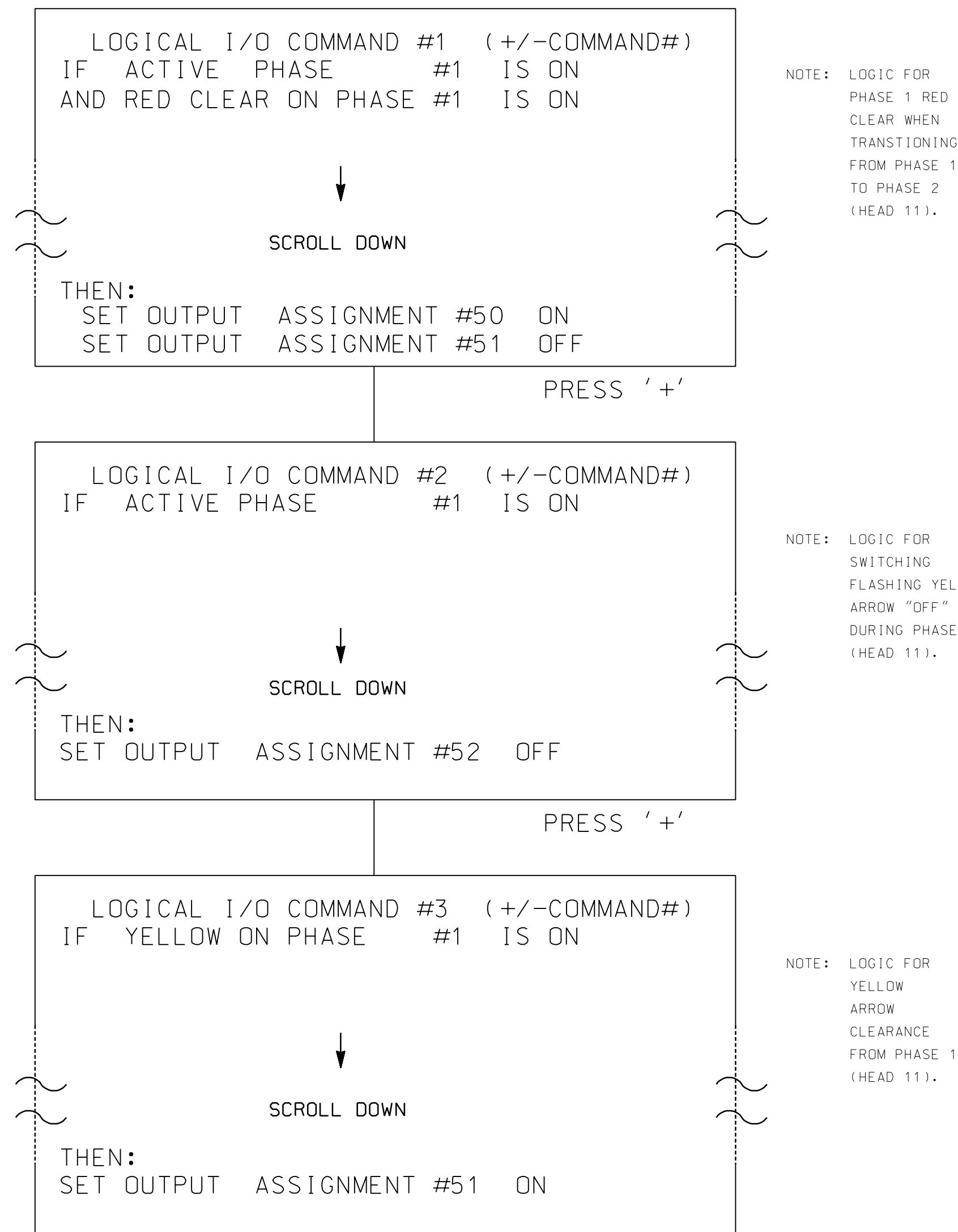
SEAL

 David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 11-1250T2

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
OUTPUT 51 = Overlap A Yellow
OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

- FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

```

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE:          |12345678910111213141516
VEH OVL PARENTS:|XX
VEH OVL NOT VEH:|
VEH OVL NOT PED:|
VEH OVL GRN EXT:|
STARTUP COLOR:  _ RED _ YELLOW _ GREEN
FLASH COLORS:   _ RED _ YELLOW X GREEN
SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0
    
```

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1250T2
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 2 - SHEET 2 OF 2

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Prepared for the Offices of:

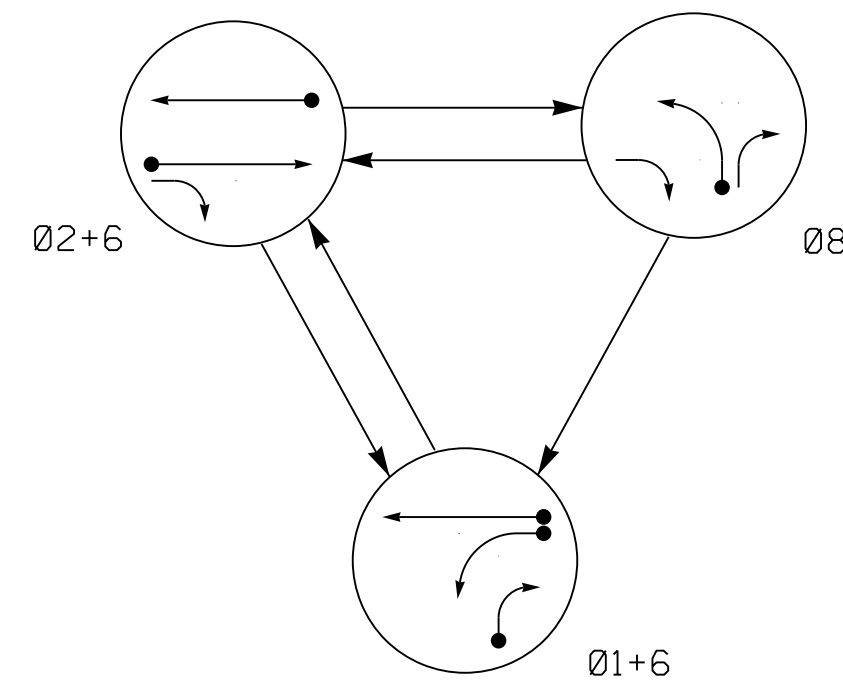
 750 N. Greenfield Pkwy, Garner, NC 27529

US 221 AT SR 1283 (CAMPUS DR.)	
DIVISION 11	ASHE COUNTY WEST JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL
NORTH CAROLINA
PROFESSIONAL
ENGINEER
DAVID T. SEARS
044558

DocuSigned by:
David T. Sears 2/7/2020
SIGNATURE DATE
SIG. INVENTORY NO. 11-1250T2

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	Ø 1 + 6	Ø 2 + 6	Ø 8	FLASH
11	←	←	←	←
21	R	G	R	Y
22	R	G	R	Y
61,62	G	G	R	Y
81	R	R	G	R
82	R	R	G	R

OASIS 2070 LOOP & DETECTOR INSTALLATION CHART											
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING						
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
1A	6X40	0	*	*	1	Y	Y	-	-	-	*
1B	6X40	0	*	*	1	Y	Y	-	-	15	*
2A	6X6	420	*	*	2	Y	Y	-	2.2	-	*
2B	6X6	110	*	*	2	Y	Y	-	-	-	*
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	*
6B	6X6	110	*	*	6	Y	Y	-	-	-	*
8A	6X40	0	*	*	8	Y	Y	-	-	3	*

* Video Detection

3 PHASE FULLY ACTUATED (ISOLATED)

NOTES

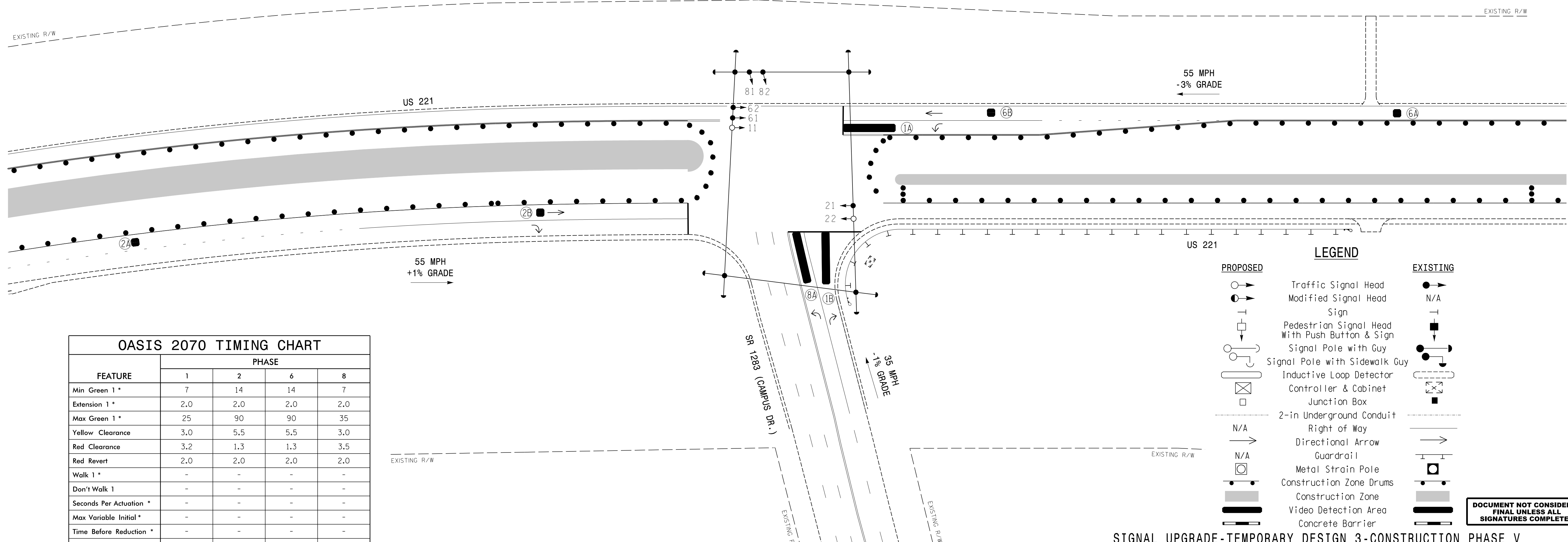
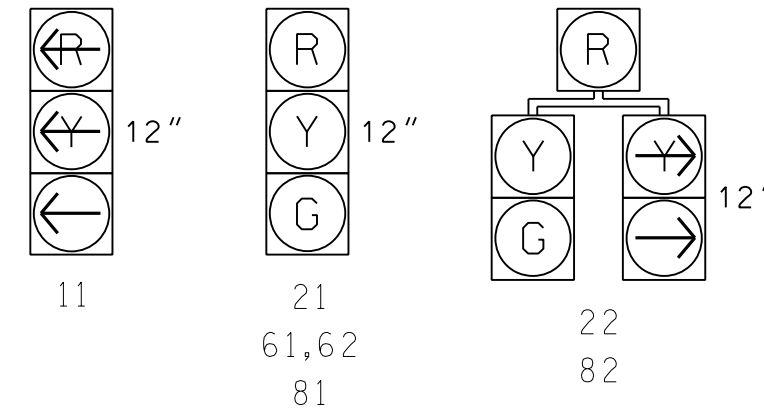
- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 1 MAY BE LAGGED.
- REPOSITION EXISTING SIGNAL HEADS NUMBERED 21, 81, AND 82.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.

PHASING DIAGRAM DETECTION LEGEND

- ← ● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ← UNSIGNALIZED MOVEMENT
- ← PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.

All Heads L.E.D.



FEATURE	PHASE			
	1	2	6	8
Min Green 1 *	7	14	14	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	25	90	90	35
Yellow Clearance	3.0	5.5	5.5	3.0
Red Clearance	3.2	1.3	1.3	3.5
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	-	MIN RECALL	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	YELLOW	-
Dual Entry	-	-	-	-
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

PROPOSED	LEGEND	EXISTING
○	Traffic Signal Head	●
○	Modified Signal Head	N/A
○	Sign	N/A
○	Pedestrian Signal Head With Push Button & Sign	○
○	Signal Pole with Guy	○
○	Signal Pole with Sidewalk Guy	○
□	Inductive Loop Detector	□
□	Controller & Cabinet	□
□	Junction Box	□
○	2-in Underground Conduit	○
N/A	Right of Way	---
N/A	Directional Arrow	→
N/A	Guardrail	— —
○	Metal Strain Pole	○
○	Construction Zone Drums	○
■	Construction Zone	■
■	Video Detection Area	■
■	Concrete Barrier	■

SIGNAL UPGRADE-TEMPORARY DESIGN 3-CONSTRUCTION PHASE V

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Prepared for:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

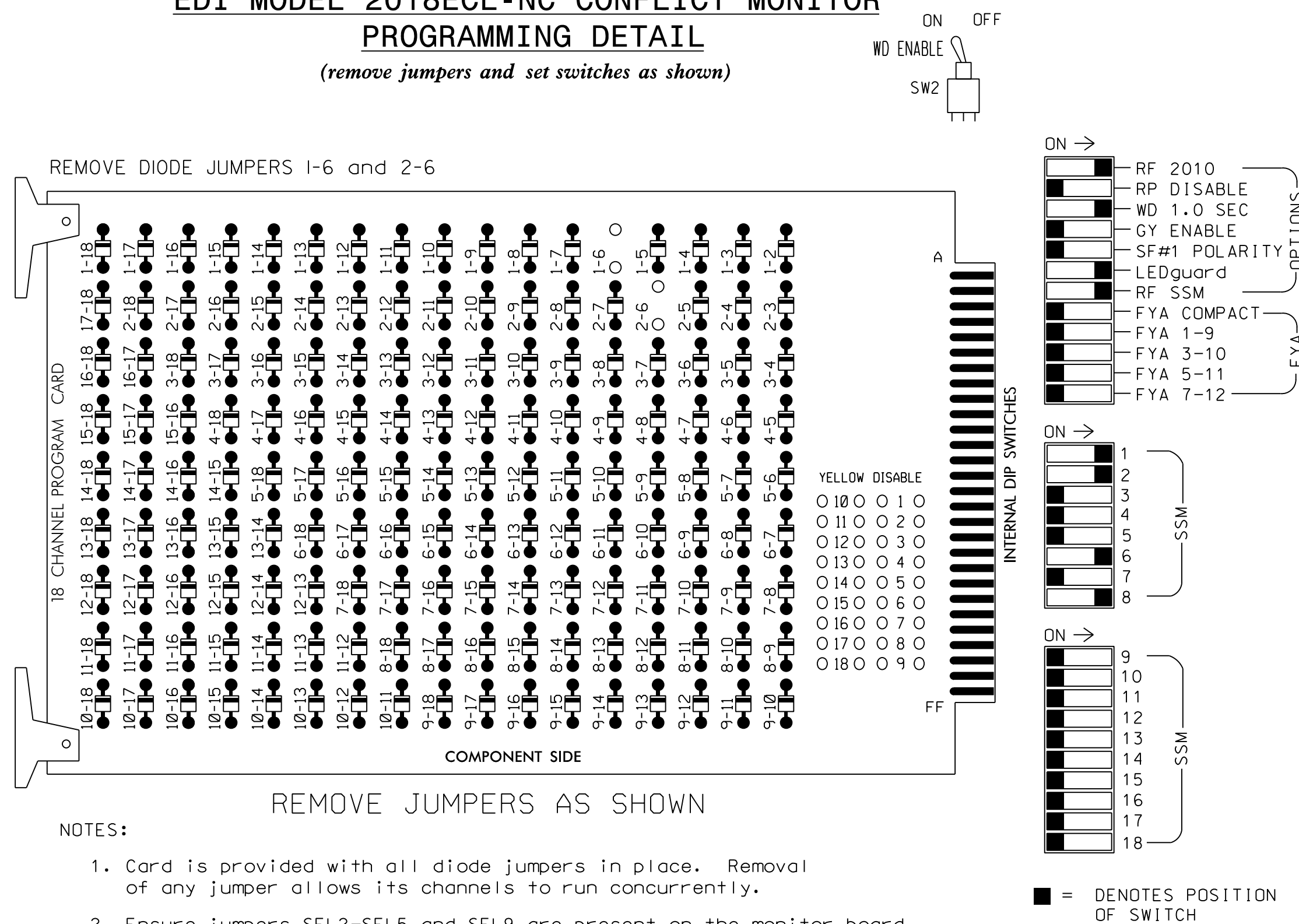
US 221
 AT
 SR 1283 (CAMPUS DR.)
 DIVISION 11 ASHE CO. WEST JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: _____ INIT. DATE _____

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-1250T3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S8,S11
 PHASES USED.....1,2,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

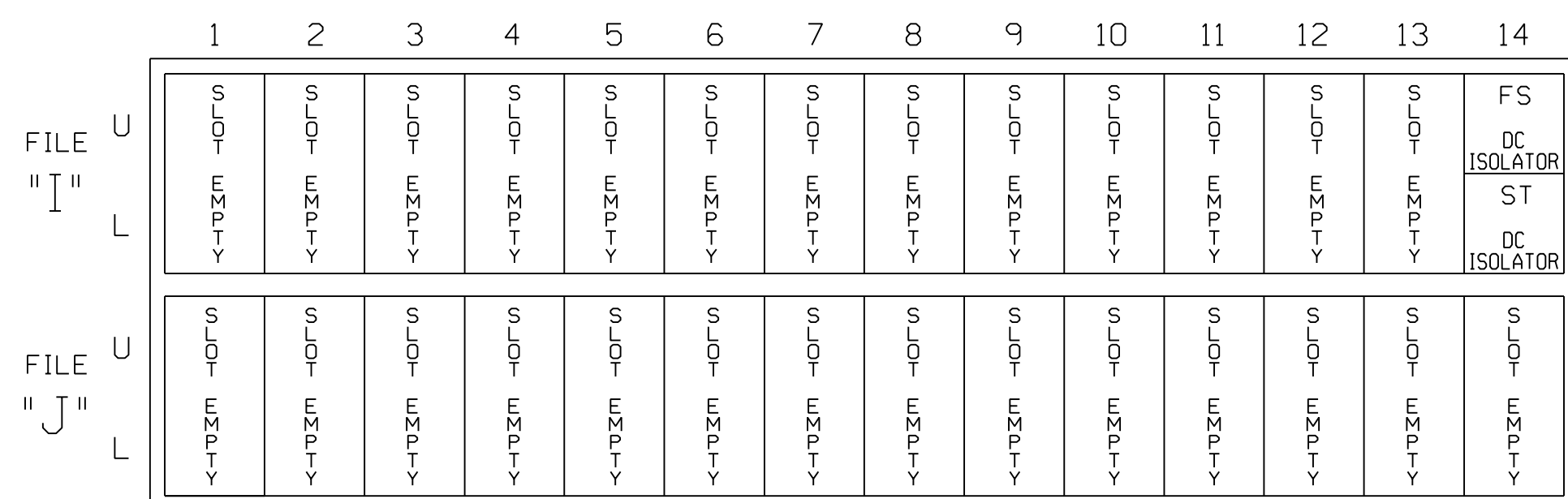
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	NU	NU	NU	NU	61,62	NU	NU	22	81,82	NU	NU	NU	NU	NU	NU
RED		128						134			107							
YELLOW		129						135			108							
GREEN		130						136			109							
RED ARROW	125																	
YELLOW ARROW	126	126									108							
GREEN ARROW	127	127									109							

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

For zones 1A, 1B, 2A, 2B, 6A, 6B, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPORARY DESIGN 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 221 AT SR 1283 (CAMPUS DR.)

DIVISION 11 ASHE COUNTY WEST JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: David T. Sears 2/7/2020

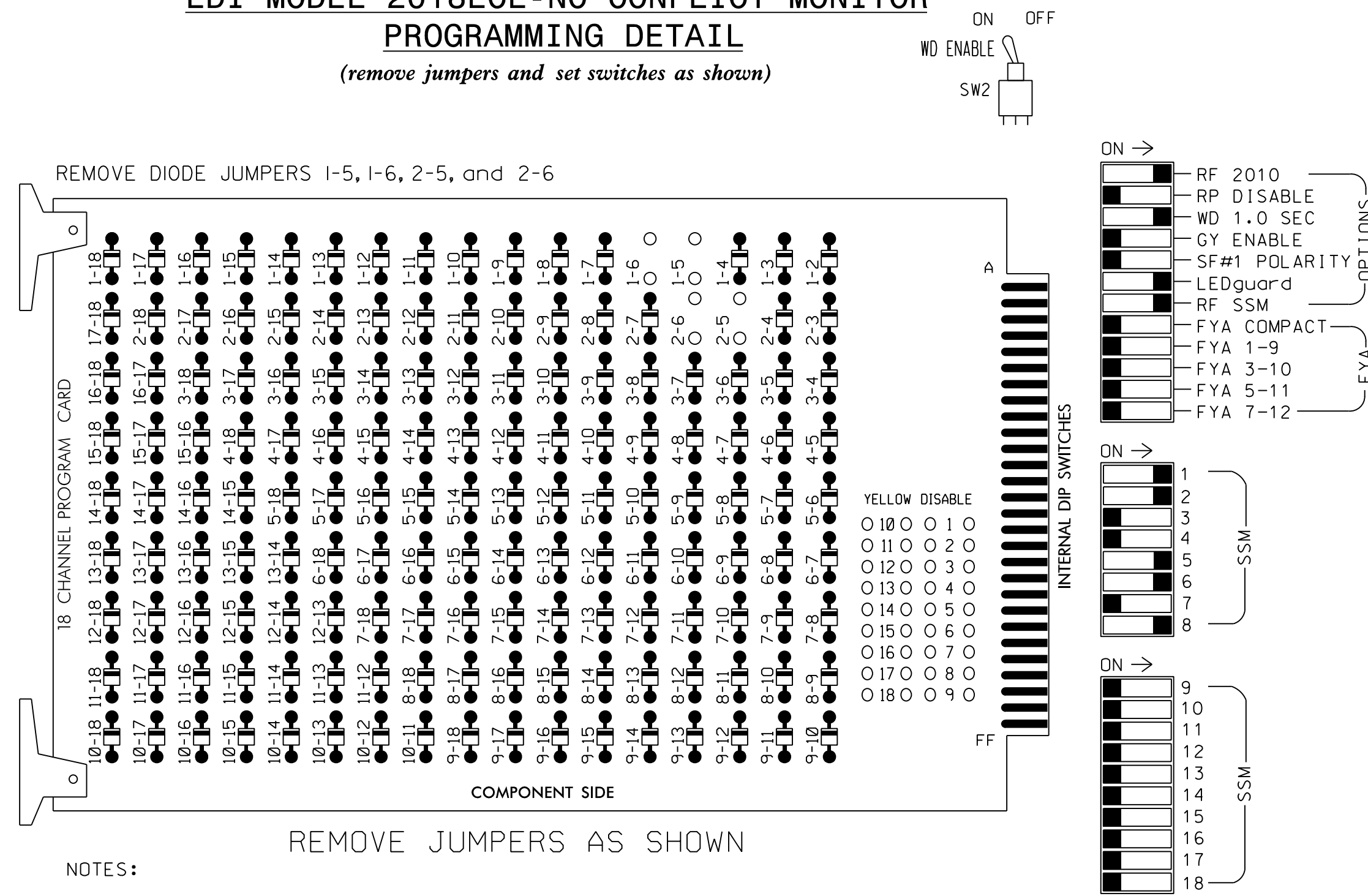
SIGNATURE DATE

SIG. INVENTORY NO. 11-1250T3

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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S7,S8,S11
 PHASES USED.....1,2,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

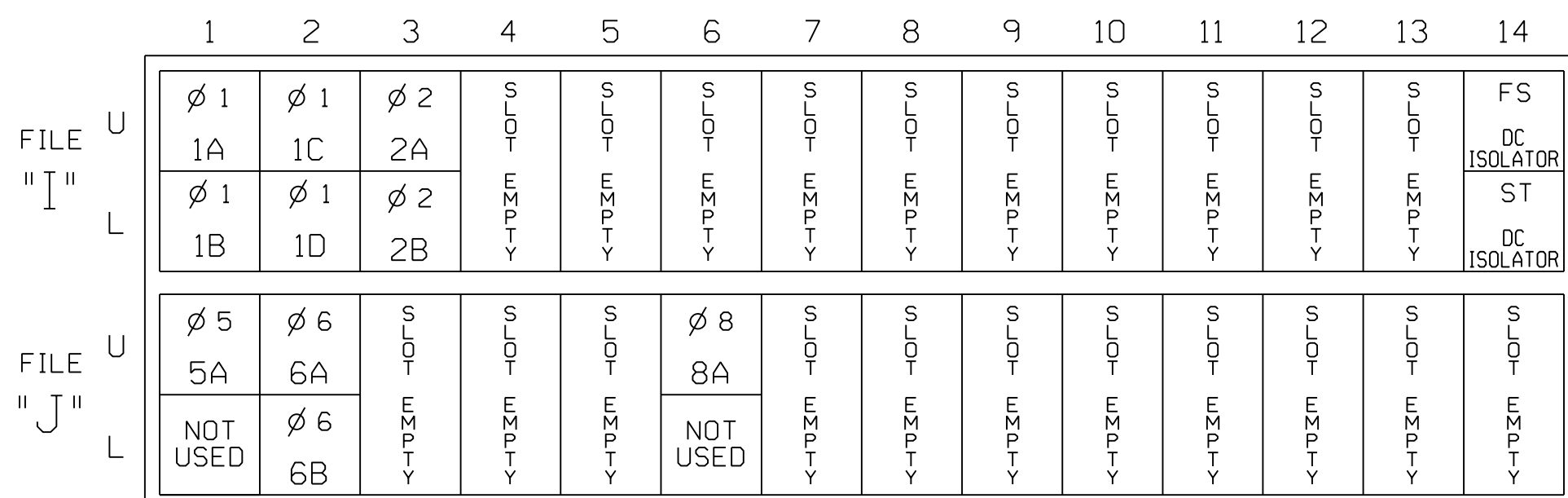
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11,12	82	21,22	NU	NU	NU	NU	51	61,62	NU	NU	81,82,83	22	NU	NU	NU	NU	NU
RED		128							134			107						
YELLOW		129							135			108						
GREEN		130							136			109						
RED ARROW	125								131									
YELLOW ARROW	126	126							132			108						
GREEN ARROW	127	127							133			109						

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



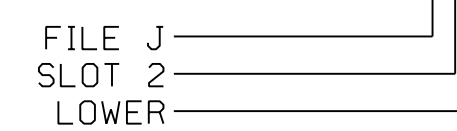
EX. : 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A	TB2-1,2	I1U	56	18	1	1	Y	Y			
1B	TB2-3,4	I1L	56	18	1	1	Y	Y			
1C	TB2-5,6	I2U	39	1	2	1	Y	Y			15
1D	TB2-7,8	I2L	43	5	12	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1250
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - FINAL DESIGN

ELECTRICAL AND PROGRAMMING DETAILS FOR:
 Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

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US 221 AT SR 1283 (CAMPUS DR.)

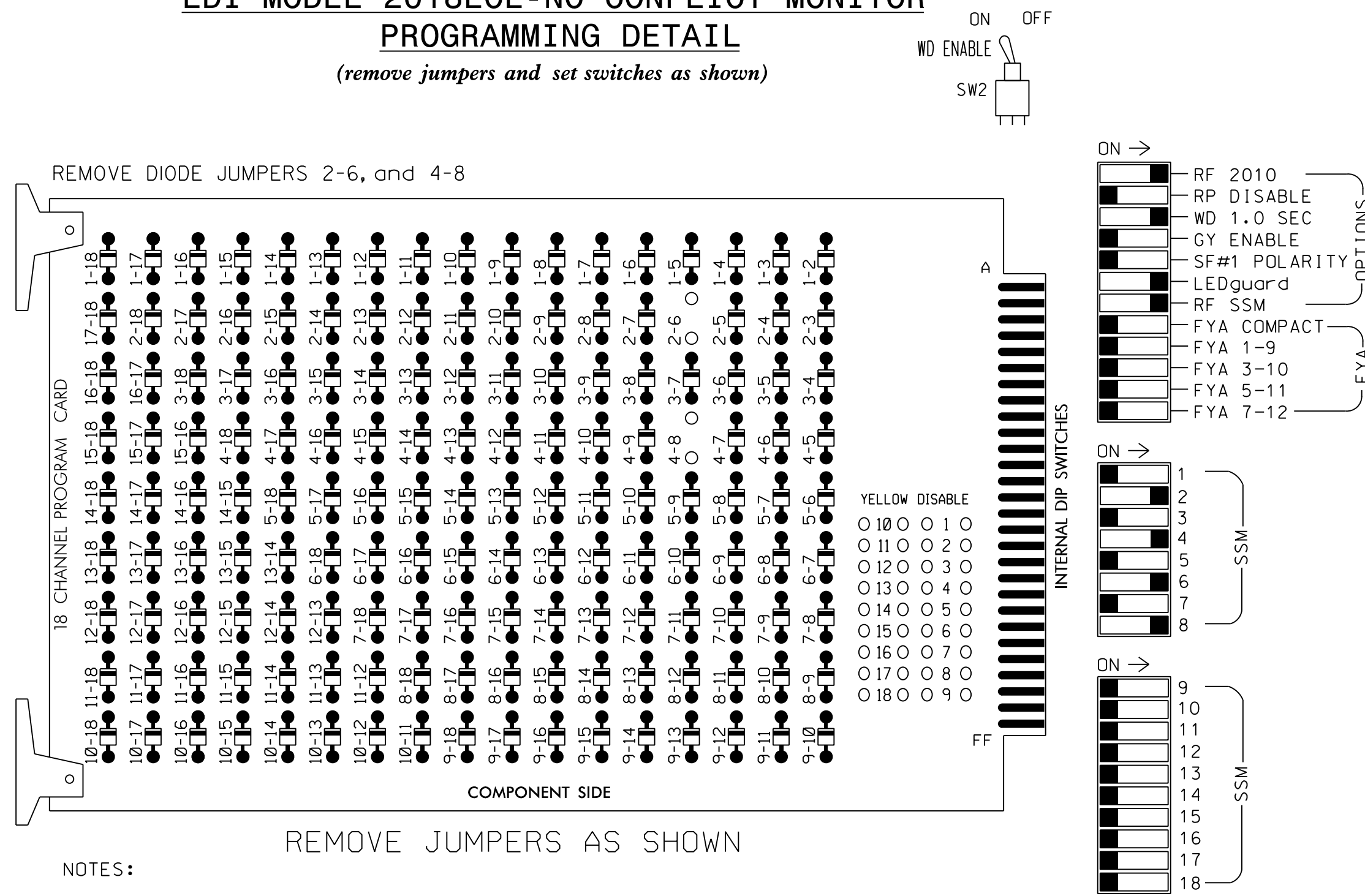
DIVISION 11	ASHE COUNTY	WEST JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS	
PREPARED BY: W.P. JONES	REVIEWED BY:	
REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL
 NORTH CAROLINA PROFESSIONAL SEAL 044558
 ENGINEER DAVID T. SEARS
 Documented by David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 11-1250

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

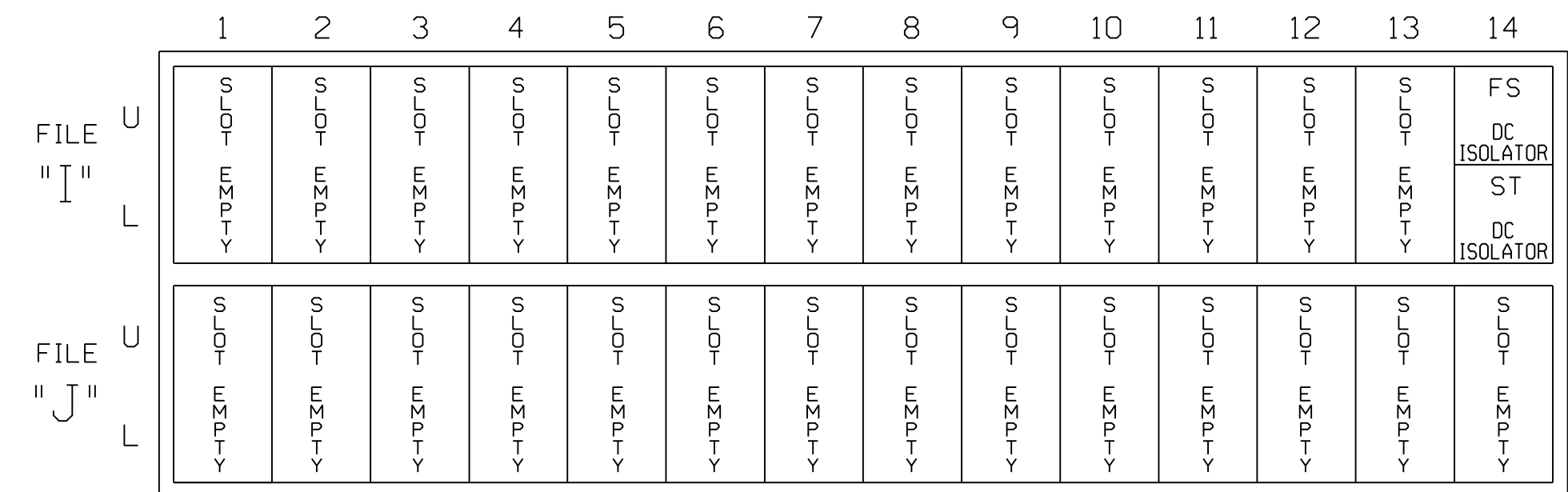
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 4A, 4B, 6A, 6B, 6C, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1238T1
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

US 221 AT SR 1245 (LONG STREET)

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS INIT. DATE

INIT. DATE

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS

DocuSigned by: David T. Sears 2/7/2020

750 N. Greenfield Pkwy, Garner, NC 27529

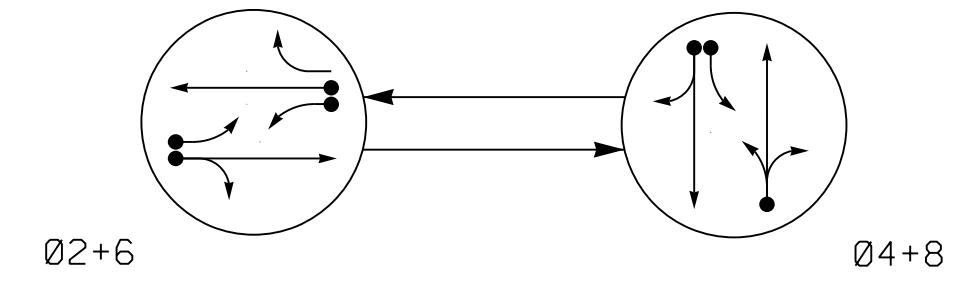
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PHASING DIAGRAM



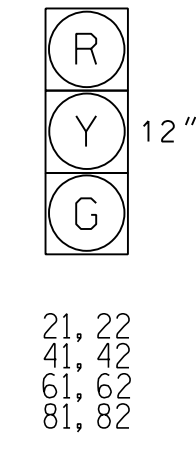
PHASING DIAGRAM DETECTION LEGEND
◄●◄ DETECTED MOVEMENT
◄◄ UNDETECTED MOVEMENT (OVERLAP)
◄--- UNSIGNALIZED MOVEMENT
◄---> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
2A	6X6	420	*	*	2	Y	Y	-	2.2	-	-	*
2B	6X6	110	*	*	2	Y	Y	-	-	-	-	*
2C	6X40	0	*	*	2	Y	Y	-	-	-	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	3	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	10	-	*
6A	6X6	420	*	*	6	Y	Y	-	2.2	-	-	*
6B	6X6	110	*	*	6	Y	Y	-	-	-	-	*
6C	6X40	0	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	0	*	*	8	Y	Y	-	-	10	-	*

* VIDEO DETECTION AREA

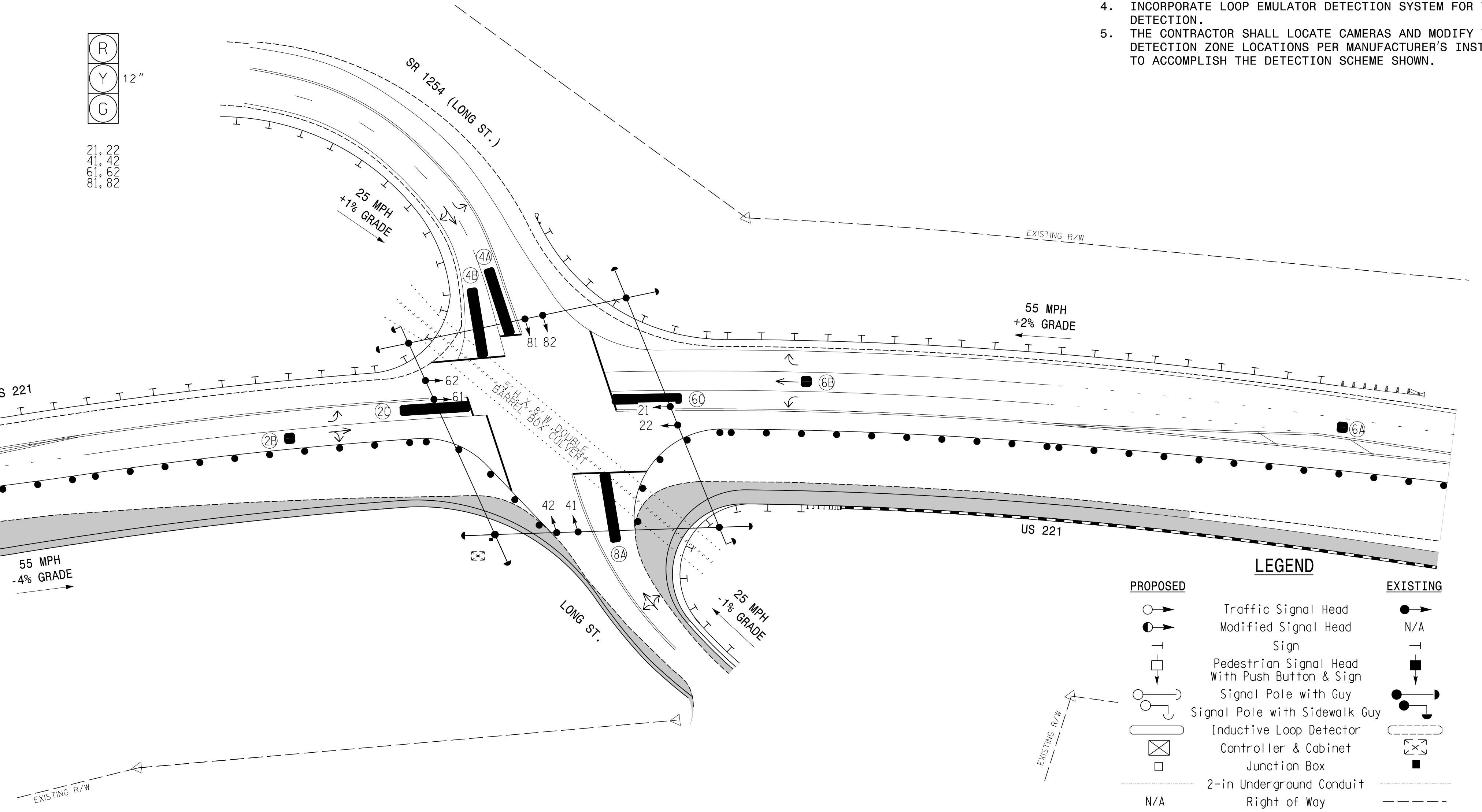
2 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	14	7	14	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	100	25	100	25
Yellow Clearance	5.6	3.1	5.0	3.2
Red Clearance	1.0	2.3	1.0	2.6
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



PROPOSED	EXISTING
	N/A
N/A	
N/A	

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SIGNAL UPGRADE - TEMPORARY DESIGN 2 - CONSTRUCTION PHASE III

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Prepared for the Offices of:

 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

US 221
 AT
 SR 1254 (LONG STREET)
 DIVISION 11 ASHE COUNTY JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: DTSEARS
 PREPARED BY: BOLDEN REVIEWED BY:

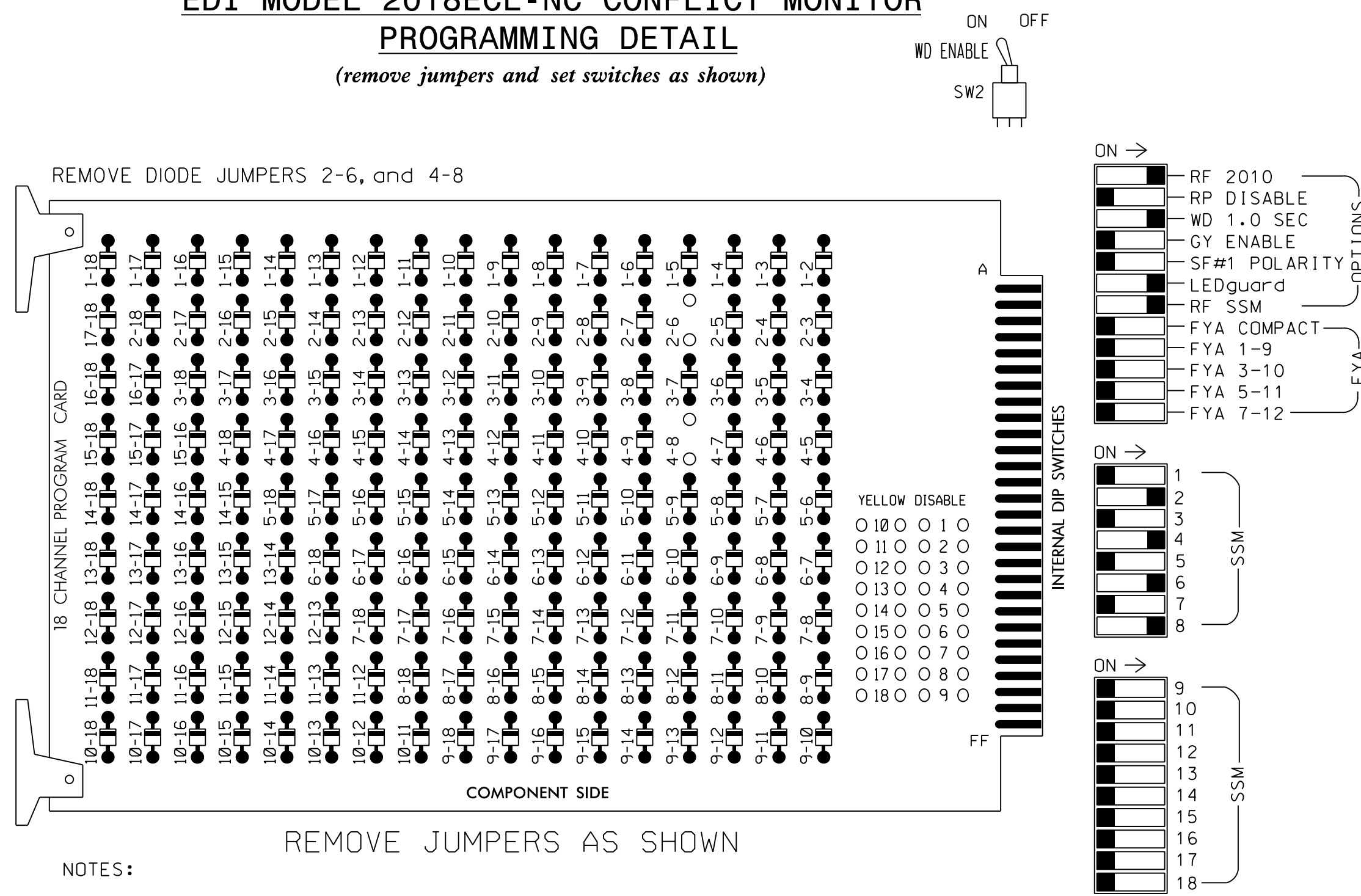
REVISIONS	INIT.	DATE

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 DocuSigned by:
 David T. Sears 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-1238T2

2/7/2020 R:\MK\OFFICE\c4s1\gnal\shd\as1\gnms1\gnal\sr2915e\sig_11-1238t2.dgn F:\keys

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

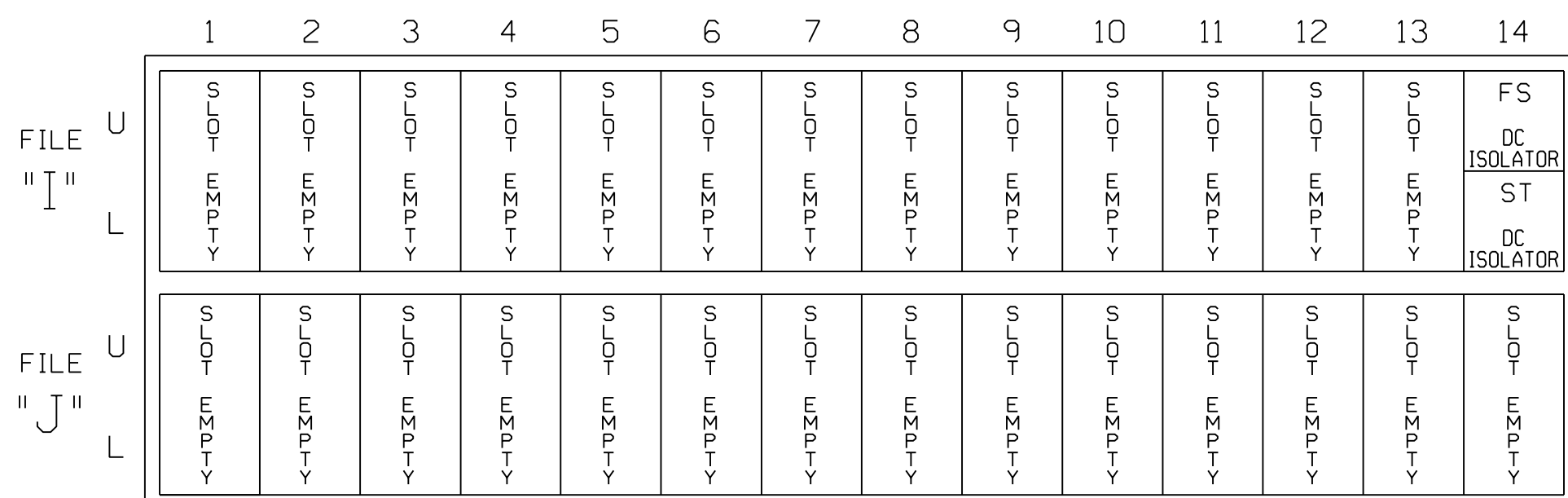
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 4A, 4B, 6A, 6B, 6C, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPORARY DESIGN 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1238T2
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

US 221 AT SR 1245 (LONG STREET)	
DIVISION 11	ASHE COUNTY JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by: David T. Sears 2/7/2020

SIGNATURE DATE

SIG. INVENTORY NO. 11-1238T2

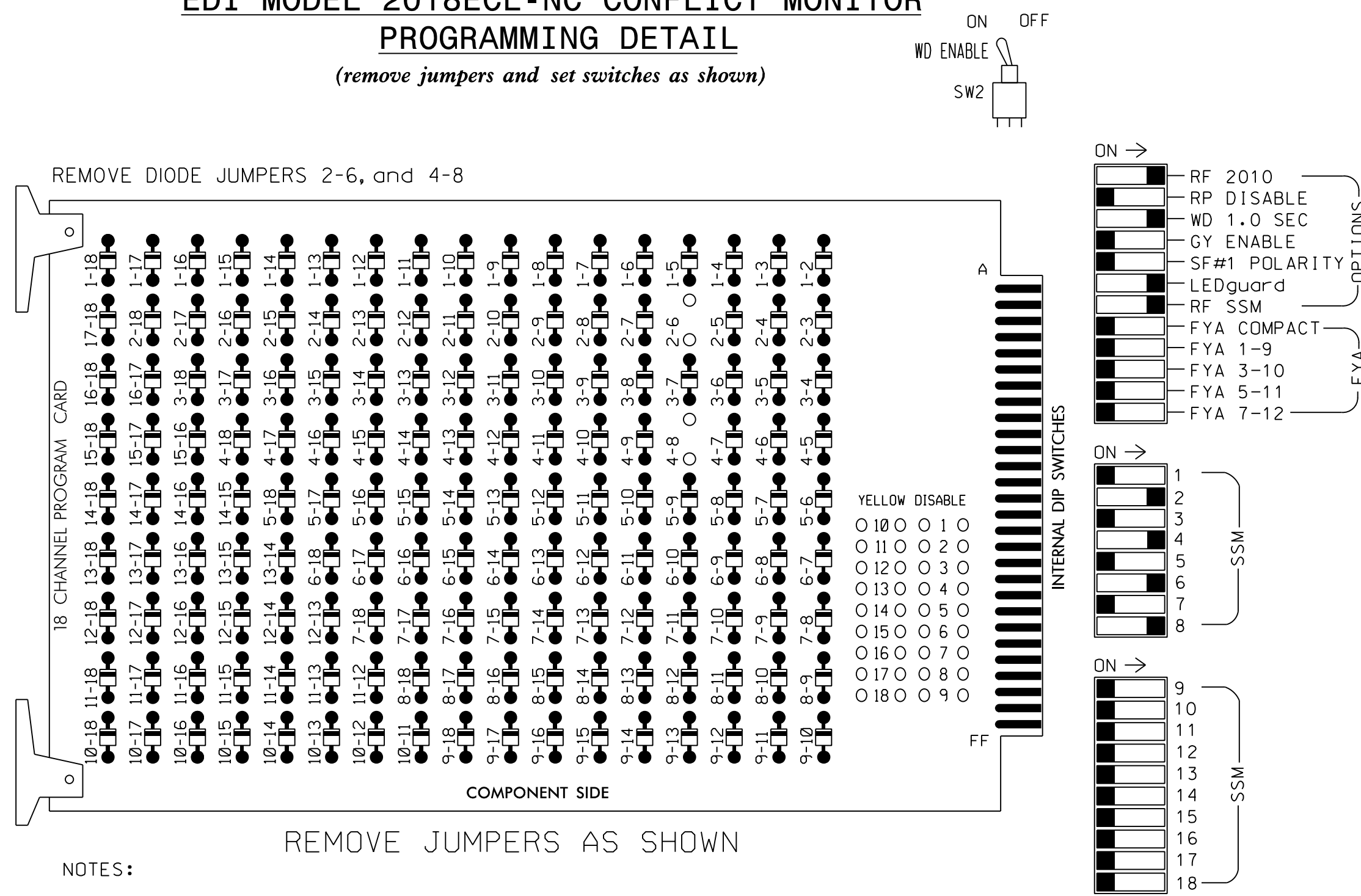
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EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

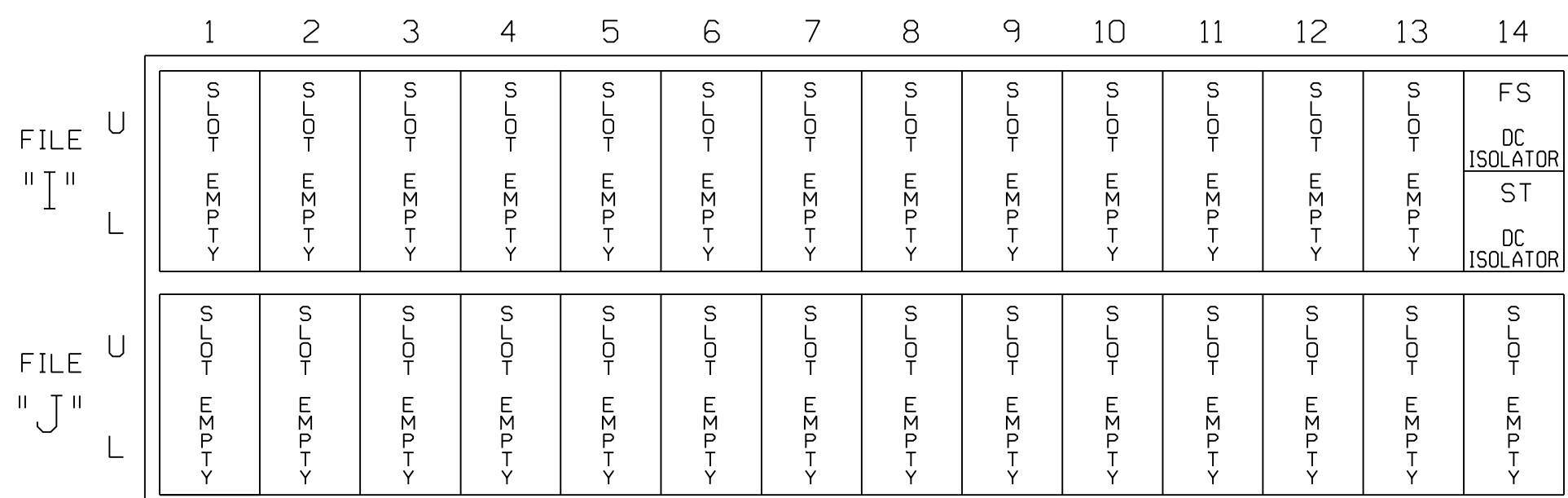
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 4A, 4B, 6A, 6B, 6C, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL AND PROGRAMMING DETAILS FOR:

US 221 AT SR 1245 (LONG STREET)

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DocuSigned by: David T. Sears 2/7/2020

SIGNATURE DATE

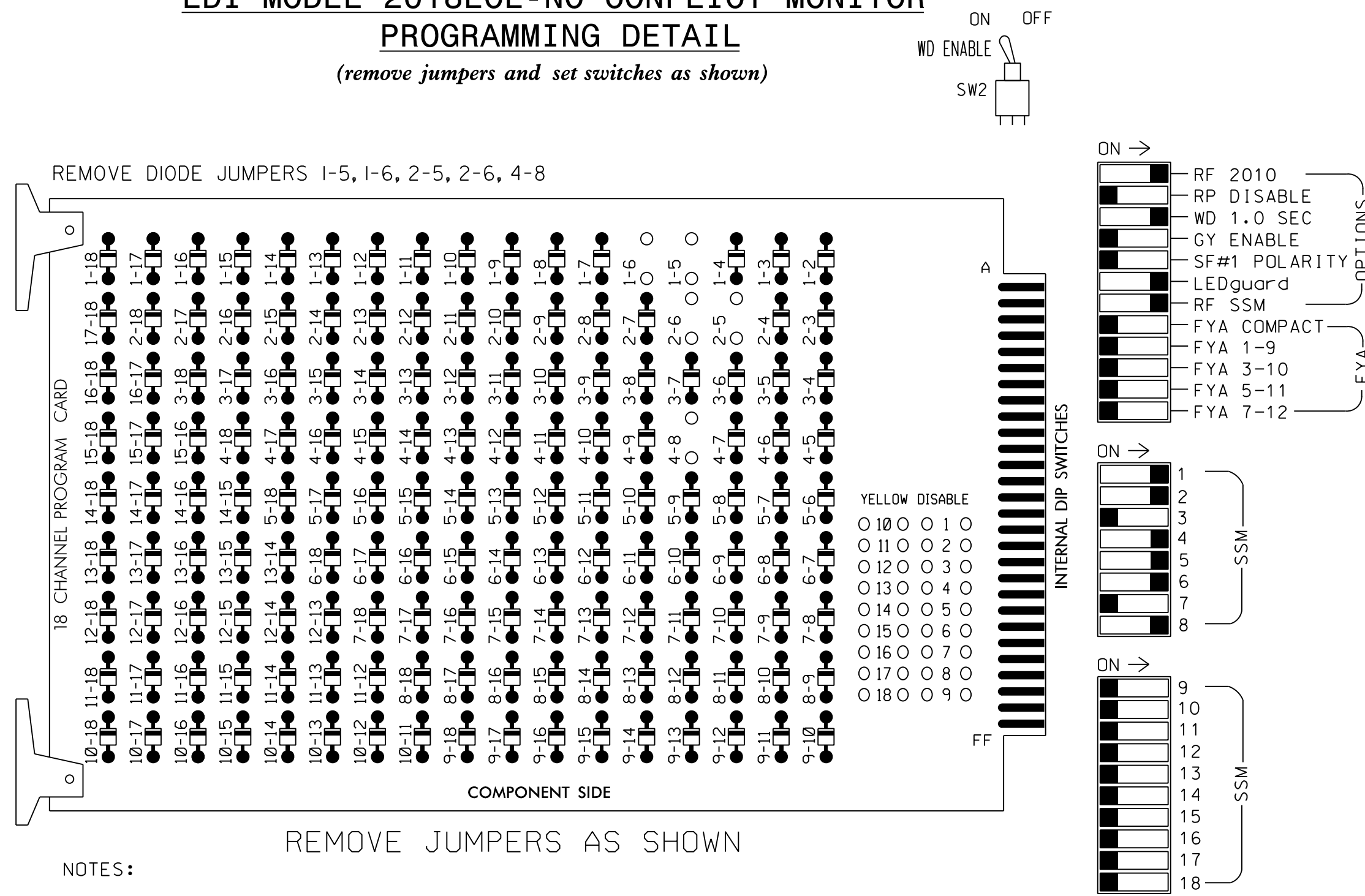
SIG. INVENTORY NO. 11-1238T3

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1238T3
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 3

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11
 PHASES USED.....1,2,4,5,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

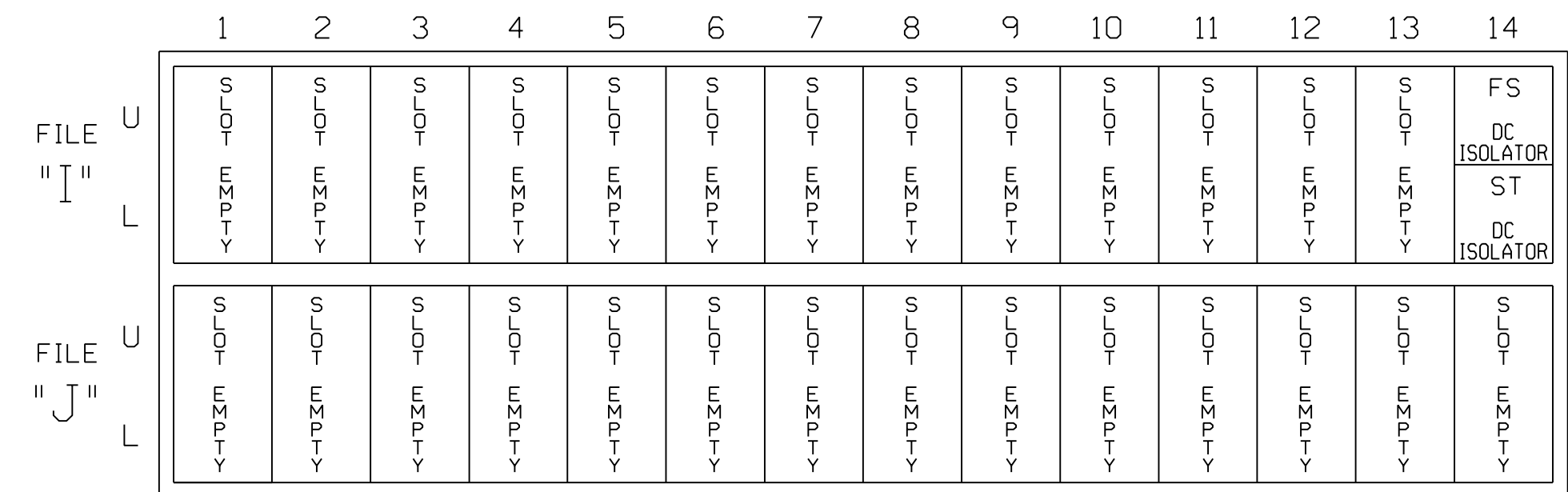
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	21,22	NU	NU	41,42	NU	51	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125						131											
YELLOW ARROW	126						132											
FLASHING YELLOW ARROW																		
GREEN ARROW	127						133											

NU = Not Used

INPUT FILE POSITION LAYOUT

(front view)



SPECIAL DETECTOR NOTE

For zones 1A, 2A, 2B, 4A, 4B, 5A, 6A, 6B, and 8A install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1238T4
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

US 221 AT SR 1245 (LONG STREET)

DIVISION 11 Ashe County Jefferson

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

Seal: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044558 DAVID T. SEARS

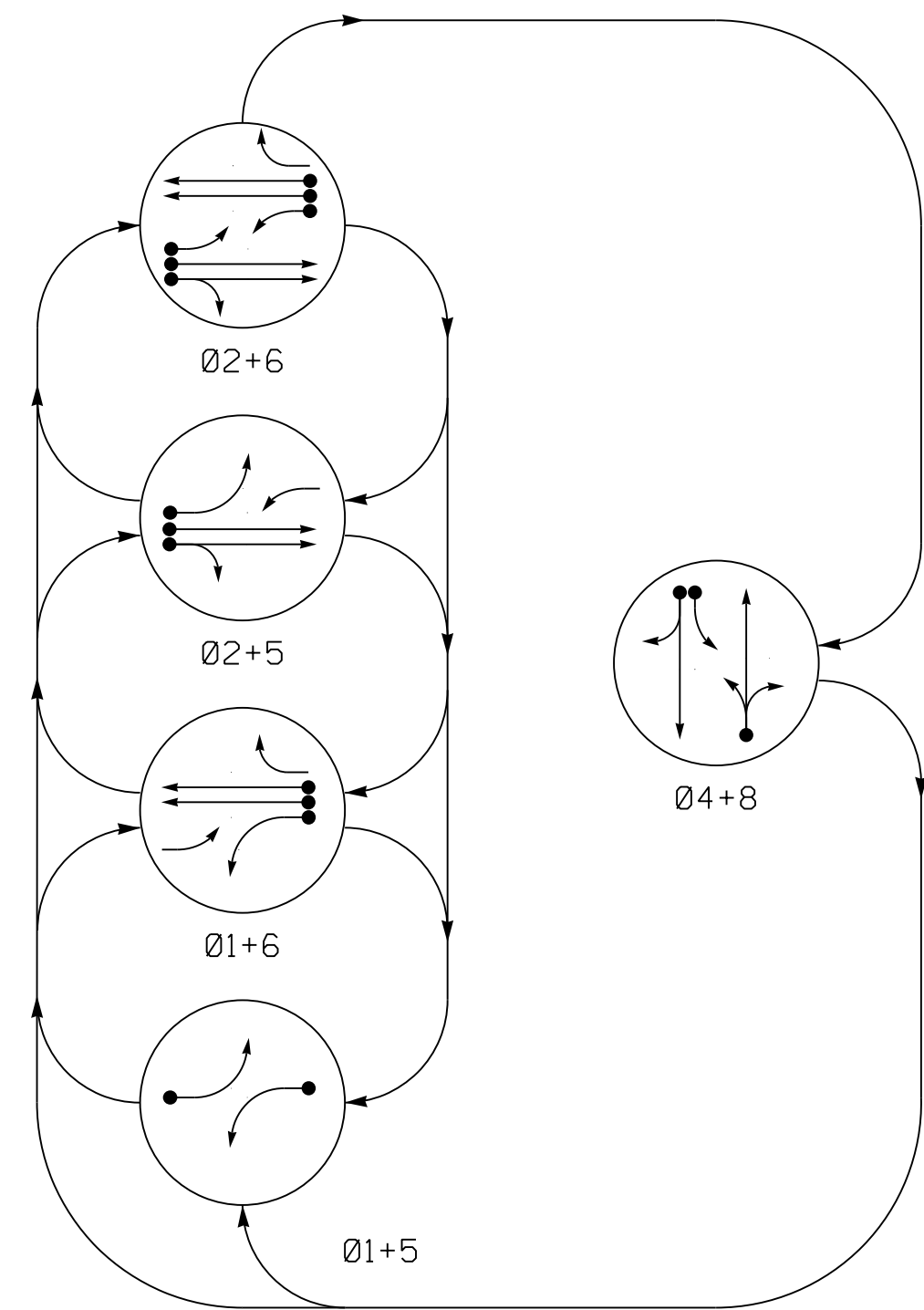
DocuSigned by: David T. Sears 2/7/2020

SIGNATURE DATE

SIG. INVENTORY NO. 11-1238T4

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PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

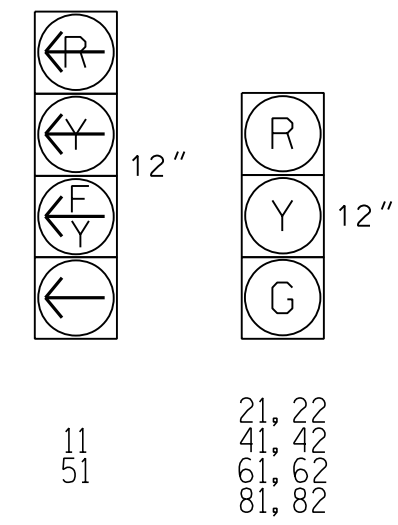
- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- UN SIGNALIZED MOVEMENT
- ←- - -> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE					FL	H	D	S
	Ø 1 + 5	Ø 1 + 6	Ø 2 + 5	Ø 2 + 6	Ø 4 + 8				
11	←	←	←	←	←	Y			
21, 22	R	R	G	G	R	Y			
41, 42	R	R	R	R	G	R			
51	←	←	←	←	←	Y			
61, 62	R	G	R	G	R	Y			
81, 82	R	R	R	R	G	R			

SIGNAL FACE I.D.

All Heads L.E.D.



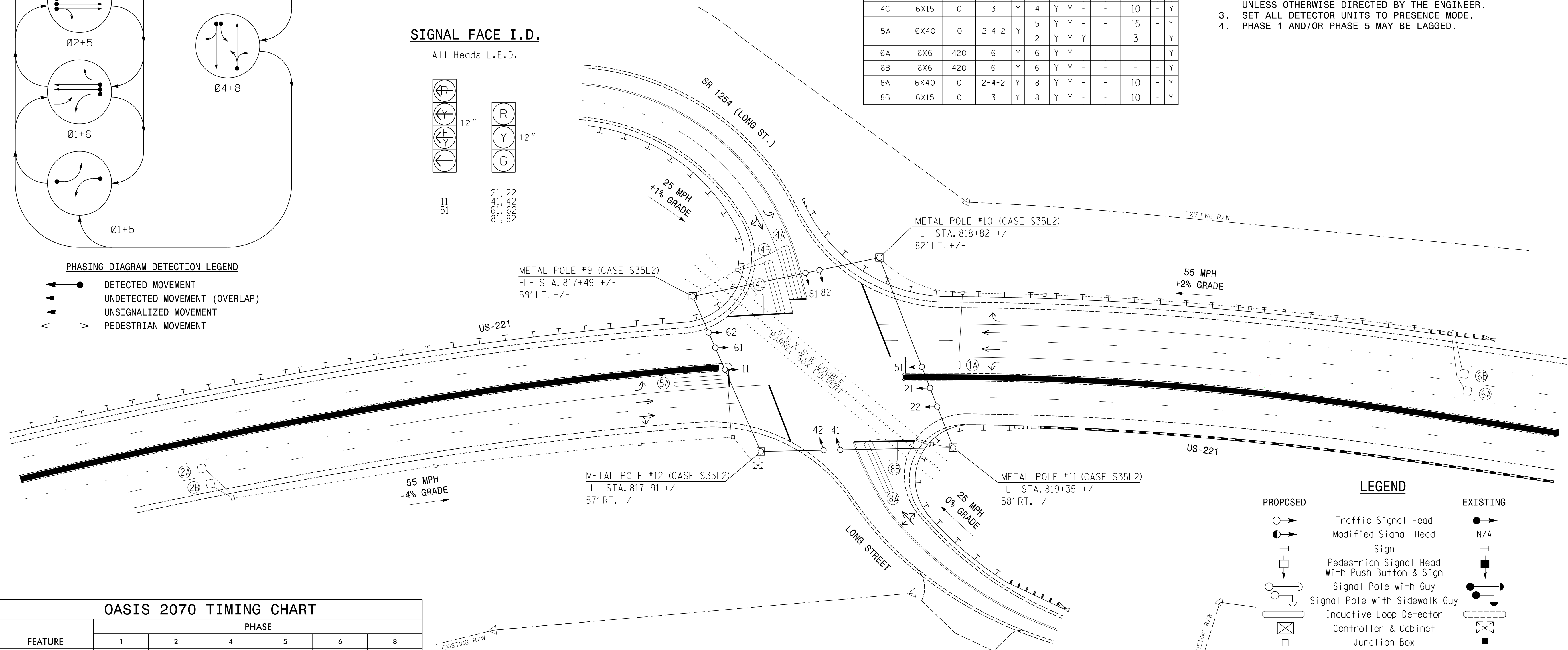
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY	STRETCH TIME			DELAY TIME
1A	6X40	0	2-4-2	Y	1	Y	Y	-	-	15	-	Y
2A	6X6	420	5	Y	2	Y	Y	-	-	3	-	Y
2B	6X6	420	5	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
4C	6X15	0	3	Y	4	Y	Y	-	-	10	-	Y
5A	6X40	0	2-4-2	Y	2	Y	Y	Y	-	3	-	Y
6A	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
6B	6X6	420	6	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	-	10	-	Y
8B	6X15	0	3	Y	8	Y	Y	-	-	10	-	Y

5 PHASE FULLY ACTUATED (ISOLATED)

NOTES

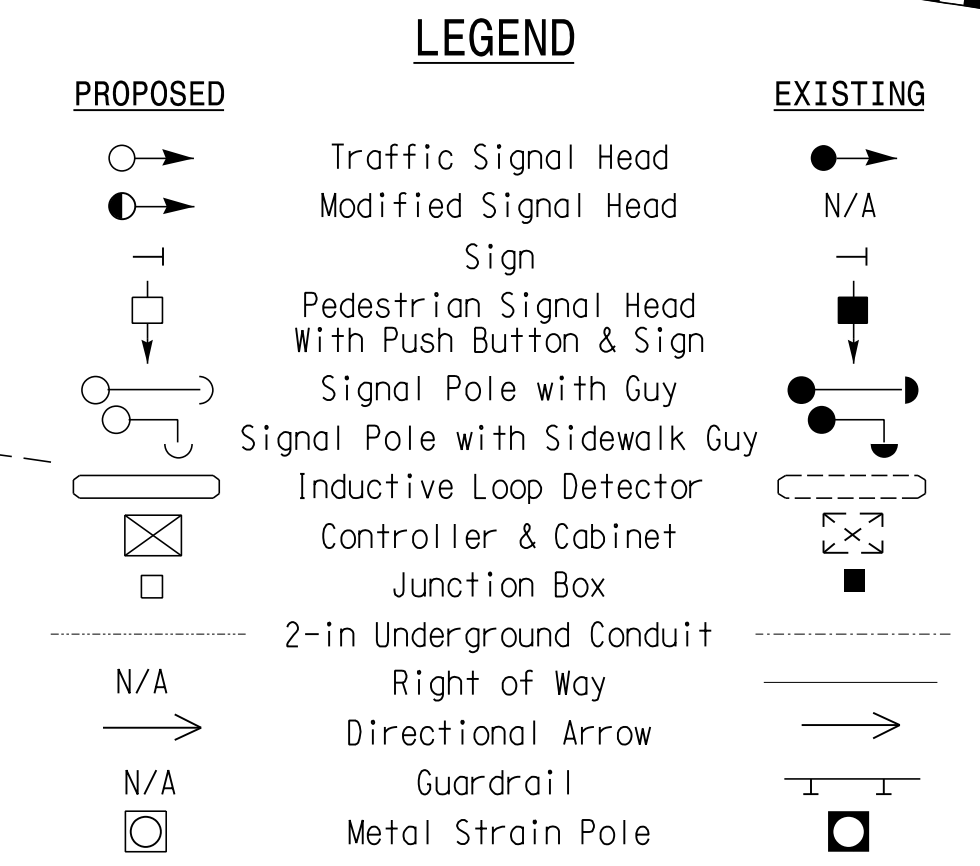
- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- PHASE 1 AND/OR PHASE 5 MAY BE LAGGED.



OASIS 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green 1 *	7	14	7	7	14	7
Extension 1 *	2.0	6.0	2.0	2.0	6.0	2.0
Max Green 1 *	20	100	25	20	100	25
Yellow Clearance	3.0	5.6	3.1	3.0	5.6	3.2
Red Clearance	2.4	1.0	2.8	2.9	1.0	3.1
Red Revert	2.0	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	-	-
Don't Walk 1	-	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	-	1.5	-
Max Variable Initial *	-	46	-	-	46	-
Time Before Reduction *	-	20	-	-	20	-
Time To Reduce *	-	50	-	-	50	-
Minimum Gap	-	2.5	-	-	2.5	-
Recall Mode	-	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	-	YELLOW	-
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.



SIGNAL UPGRADE - FINAL DESIGN

Prepared for the Offices of:
 Transportation Mobility and Safety
 NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION

US 221 AT SR 1254 (LONG STREET)

DIVISION 11 ASHE CO. JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: DSEARS

PREPARED BY: BOLDEN REVIEWED BY:

SEAL

DAVID T. SEARS
 ENGINEER

Scale: 1" = 40'

Revisions Table:

NO.	REVISIONS	INIT.	DATE

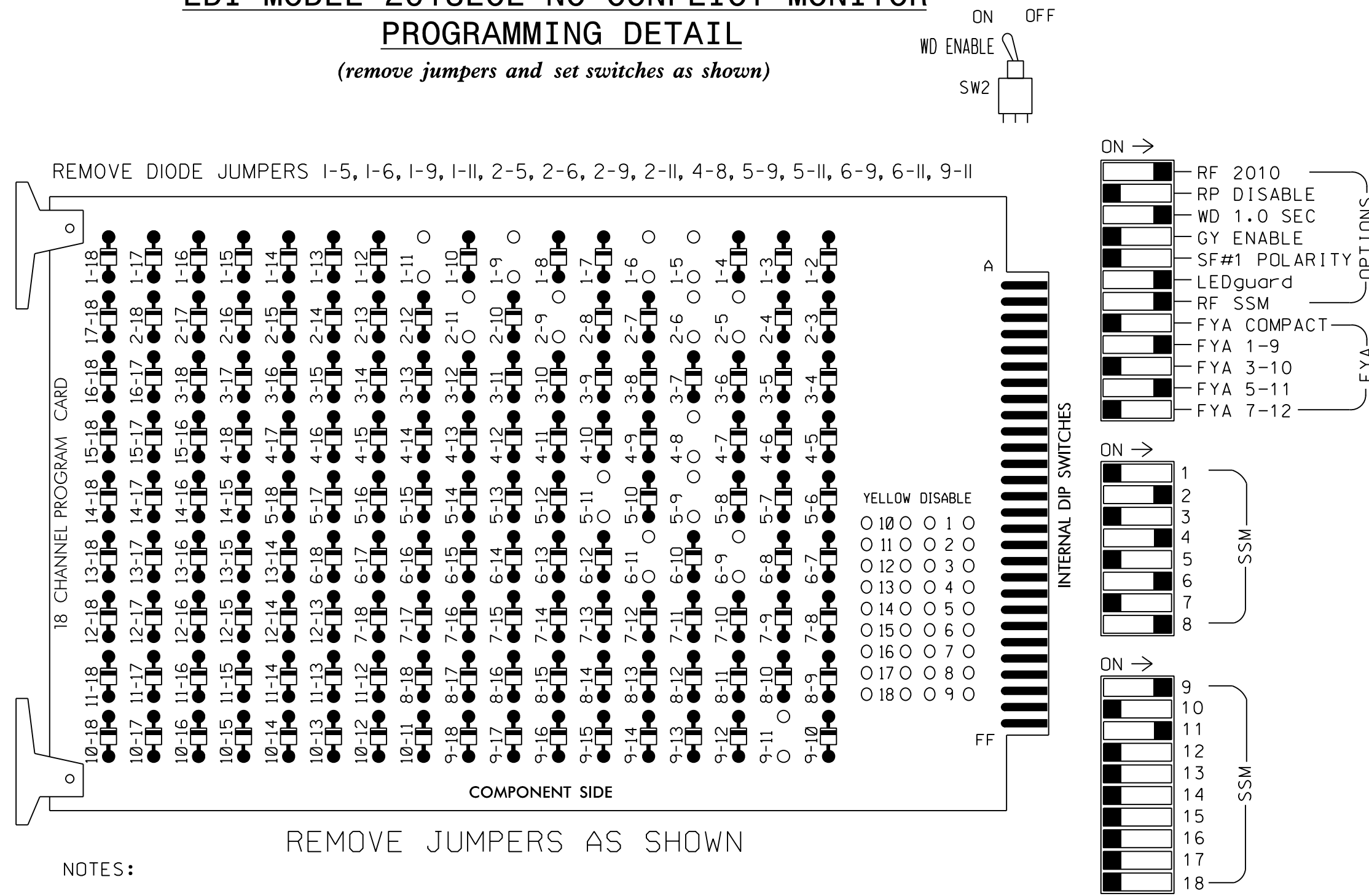
Document Not Considered Final Unless All Signatures Completed

Signature: David T. Sears, Date: 2/7/2020

Inventory No. 11-1238

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Variable Initial and Gap Reduction.
5. Program phases 2 and 6 for Startup In Green.
6. Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S7,S8,S11,AUX S1,AUX S4
 PHASES USED.....1,2,4,5,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

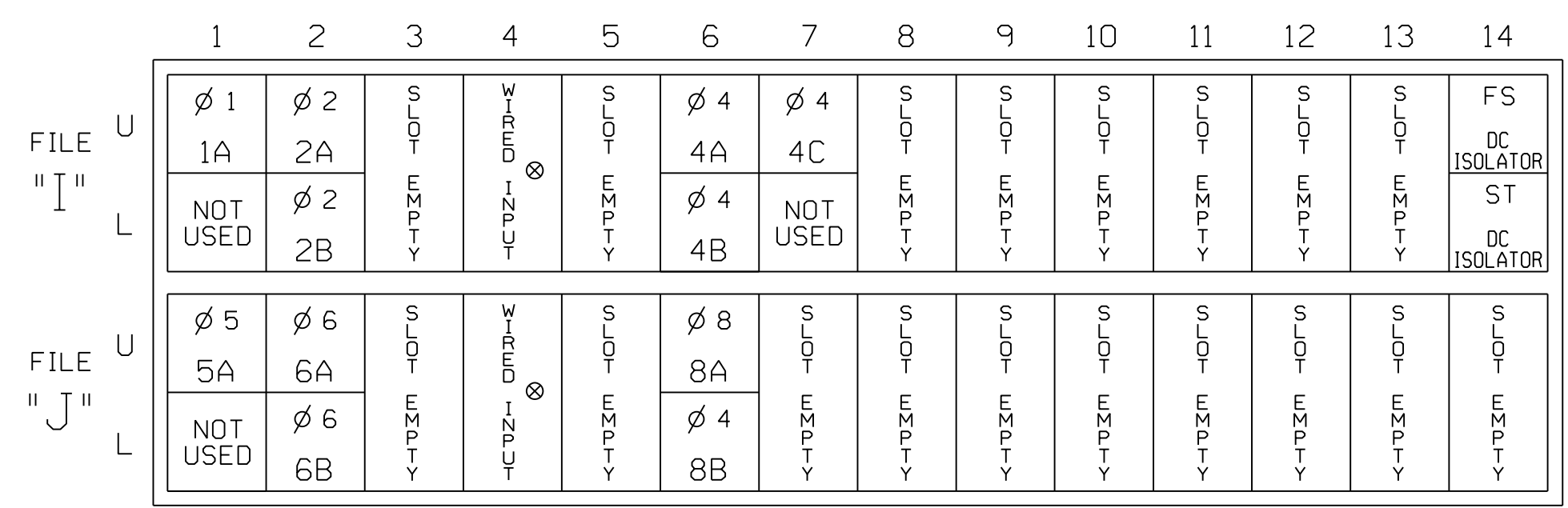
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11★	21,22	NU	NU	41,42	NU	51★	61,62	NU	NU	81,82	NU	11★	NU	NU	51★	NU	NU
RED		128			101			134			107							
YELLOW	*	129			102		*	135			108							
GREEN		130			103			136			109							
RED ARROW													A121				A114	
YELLOW ARROW													A122				A115	
FLASHING YELLOW ARROW													A123				A116	
GREEN ARROW	127							133										

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

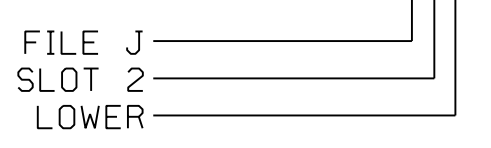


INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			10
5A ²	TB3-1,2	J1U	55	17	5	5	Y	Y			15
	-	I4U	47	9	22	2	Y	Y	Y		3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10

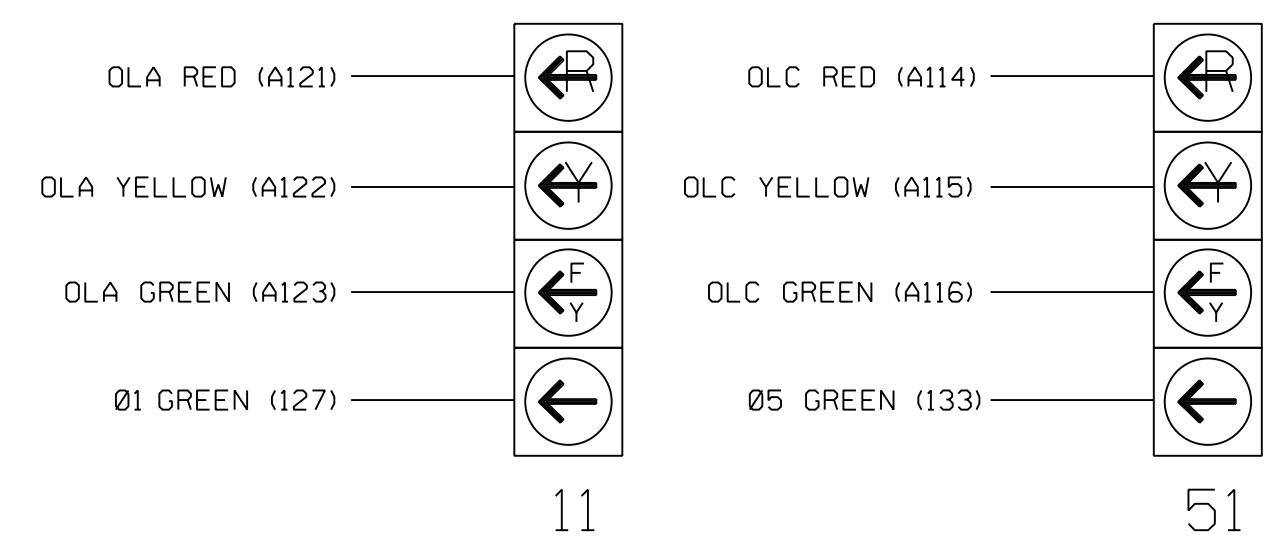
¹Add jumper from I1-W to J4-W, on rear of input file.
²Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



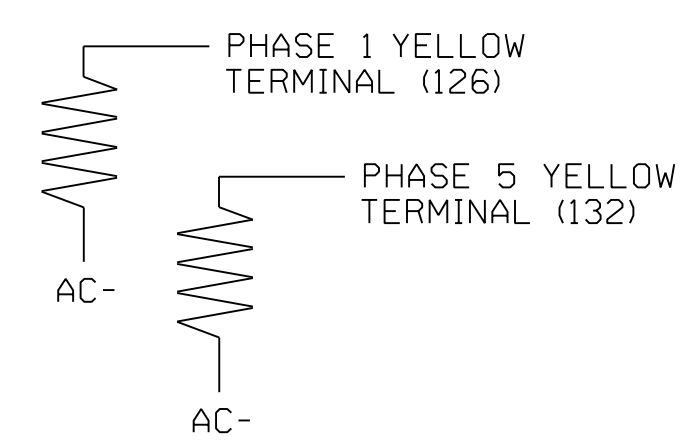
NOTE
 The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-1238
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



ELECTRICAL DETAIL - FINAL DESIGN - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS

US 221 AT SR 1245 (LONG STREET)

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS INIT. DATE

David T. Sears 2/7/2020

750 N. Greenfield Pkwy, Garner, NC 27529

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LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, 3, 4, 5, AND 6.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON
AND RED CLEAR ON PHASE #1 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #50 ON
SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
IF ACTIVE PHASE #1 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
IF YELLOW ON PHASE #1 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #51 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #4 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON
AND RED CLEAR ON PHASE #5 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #42 ON
SET OUTPUT ASSIGNMENT #43 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 5 RED CLEAR WHEN TRANSITIONING FROM PHASE 5 TO PHASE 6 (HEAD 51).

LOGICAL I/O COMMAND #5 (+/-COMMAND#)
IF ACTIVE PHASE #5 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #44 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 5 (HEAD 51).

LOGICAL I/O COMMAND #6 (+/-COMMAND#)
IF YELLOW ON PHASE #5 IS ON

↓

SCROLL DOWN

THEN:
SET OUTPUT ASSIGNMENT #43 ON

PRESS '+'

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 5 (HEAD 51).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

- OUTPUT 42 = Overlap C Red
- OUTPUT 43 = Overlap C Yellow
- OUTPUT 44 = Overlap C Green
- OUTPUT 50 = Overlap A Red
- OUTPUT 51 = Overlap A Yellow
- OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
PHASE: 112345678910111213141516
VEH OVL PARENTS: |XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN

← NOTICE GREEN FLASH

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
PHASE: 112345678910111213141516
VEH OVL PARENTS: | XX
VEH OVL NOT VEH: |
VEH OVL NOT PED: |
VEH OVL GRN EXT: |
STARTUP COLOR: _ RED _ YELLOW _ GREEN
FLASH COLORS: _ RED _ YELLOW X GREEN

← NOTICE GREEN FLASH

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
FLASH YELLOW IN CONTROLLER FLASH?...Y
GREEN EXTENSION (0-255 SEC)...0
YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

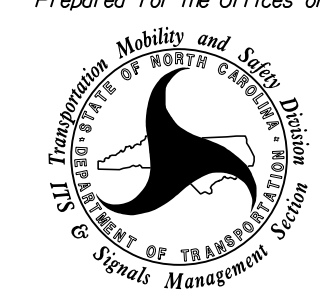
THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-1238
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

ELECTRICAL DETAIL - FINAL DESIGN - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING
DETAILS FOR:

Prepared for the Offices of:



750 N. Greenfield Pkwy, Garner, NC 27529

US 221
AT
SR 1245 (LONG STREET)

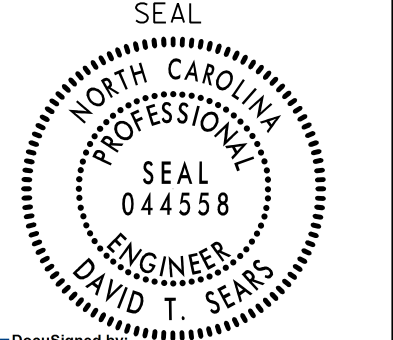
DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE


SEAL



DAVID T. SEARS
ENGINEER
2/7/2020

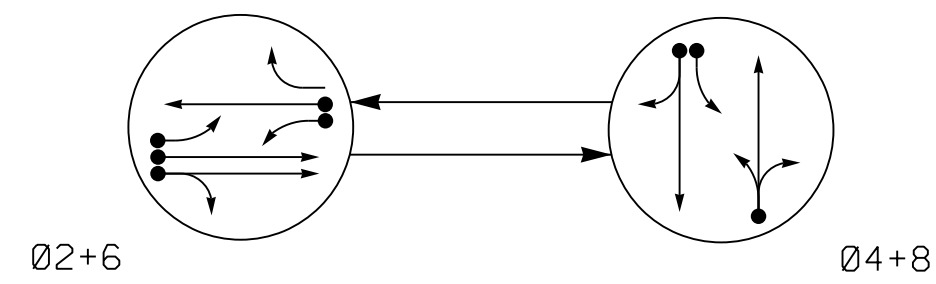
SIGNATURE DATE

SIG. INVENTORY NO. 11-1238



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PHASING DIAGRAM



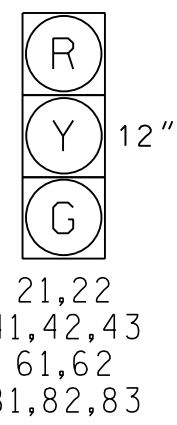
PHASING DIAGRAM DETECTION LEGEND

- ←●→ DETECTED MOVEMENT
- ←○→ UNDETECTED MOVEMENT (OVERLAP)
- ←---→ UNSIGNALIZED MOVEMENT
- ←- - - -> PEDESTRIAN MOVEMENT

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21,22	G	R	Y
41,42,43	R	G	R
61,62	G	R	Y
81,82,83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

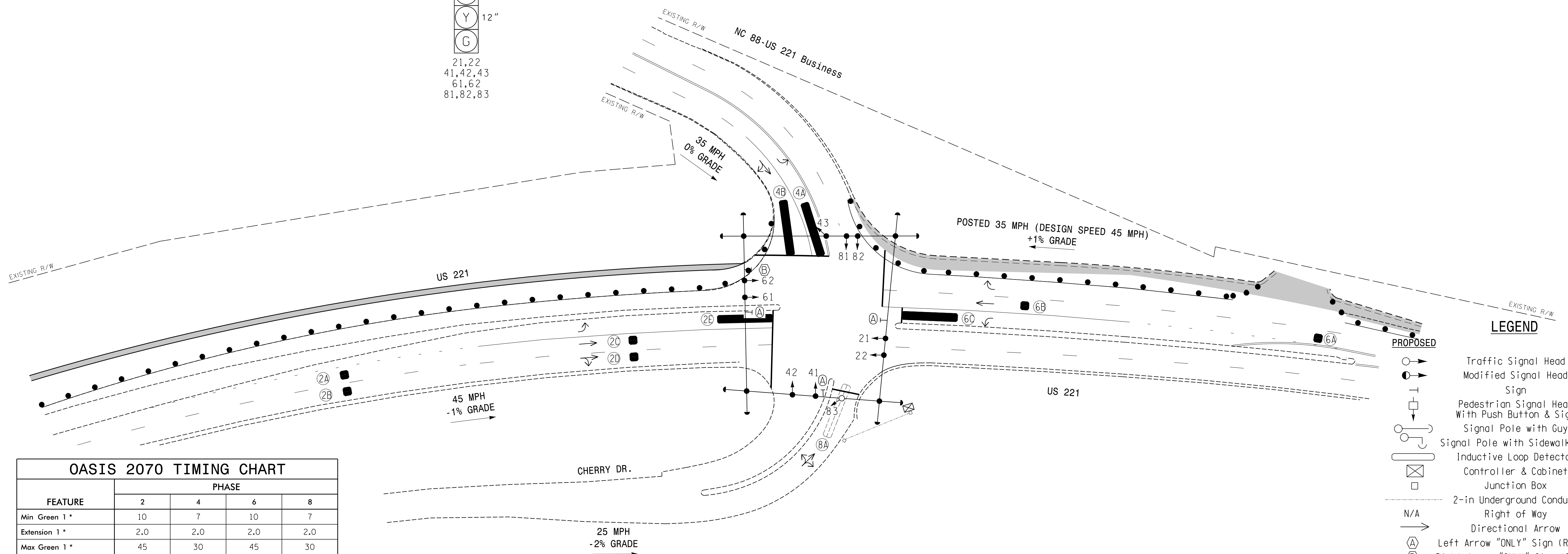
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	STRETCH FULL TIME DELAY	DELAY TIME			
2A	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2C	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2D	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2E	6X40	0	*	*	2	Y	Y	-	-	-	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	3	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	15	-	*
6A	6X6	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	6X6	90	*	*	6	Y	Y	-	-	-	-	*
6C	6X40	0	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	Y

* Video Detection

2 PHASE FULLY ACTUATED (ISOLATED)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. REPOSITION EXISTING SIGNAL HEADS NUMBERED 61 AND 62.
4. SET ALL DETECTOR UNITS TO PRESENCE MODE.
5. LOCATE NEW CABINET SO AS NOT TO OBSTRUCT SIGHT DISTANCE OF VEHICLES TURNING RIGHT ON RED.
6. INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
7. THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	30	45	30
Yellow Clearance	4.6	3.8	4.6	3.8
Red Clearance	1.3	2.8	1.3	2.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|---|--|-----|----------|
| ○ | Traffic Signal Head | ● | EXISTING |
| ○ | Modified Signal Head | N/A | |
| ○ | Sign | - | |
| ○ | Pedestrian Signal Head With Push Button & Sign | ○ | |
| ○ | Signal Pole with Guy | ○ | |
| ○ | Signal Pole with Sidewalk Guy | ○ | |
| □ | Inductive Loop Detector | □ | |
| □ | Controller & Cabinet | □ | |
| □ | Junction Box | □ | |
| - | 2-in Underground Conduit | - | |
| - | Right of Way | - | |
| → | Directional Arrow | → | |
| Ⓐ | Left Arrow "ONLY" Sign (R3-5L) | Ⓐ | |
| Ⓑ | Right Arrow "ONLY" Sign (R3-5R) | Ⓑ | |
| ■ | Video Detection Area | ■ | |
| ■ | Construction Zone | ■ | |
| ○ | Construction Zone Drums | ○ | |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE - TEMPORARY DESIGN 1 - CONSTRUCTION PHASE II

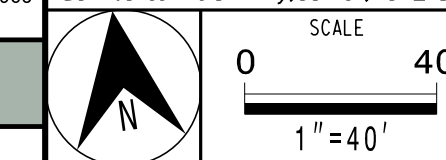
US 221 AT NC 88-US 221 BUSINESS / CHERRY DR. ASHE CO. JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN

PREPARED BY: DTSEARS REVIEWED BY:

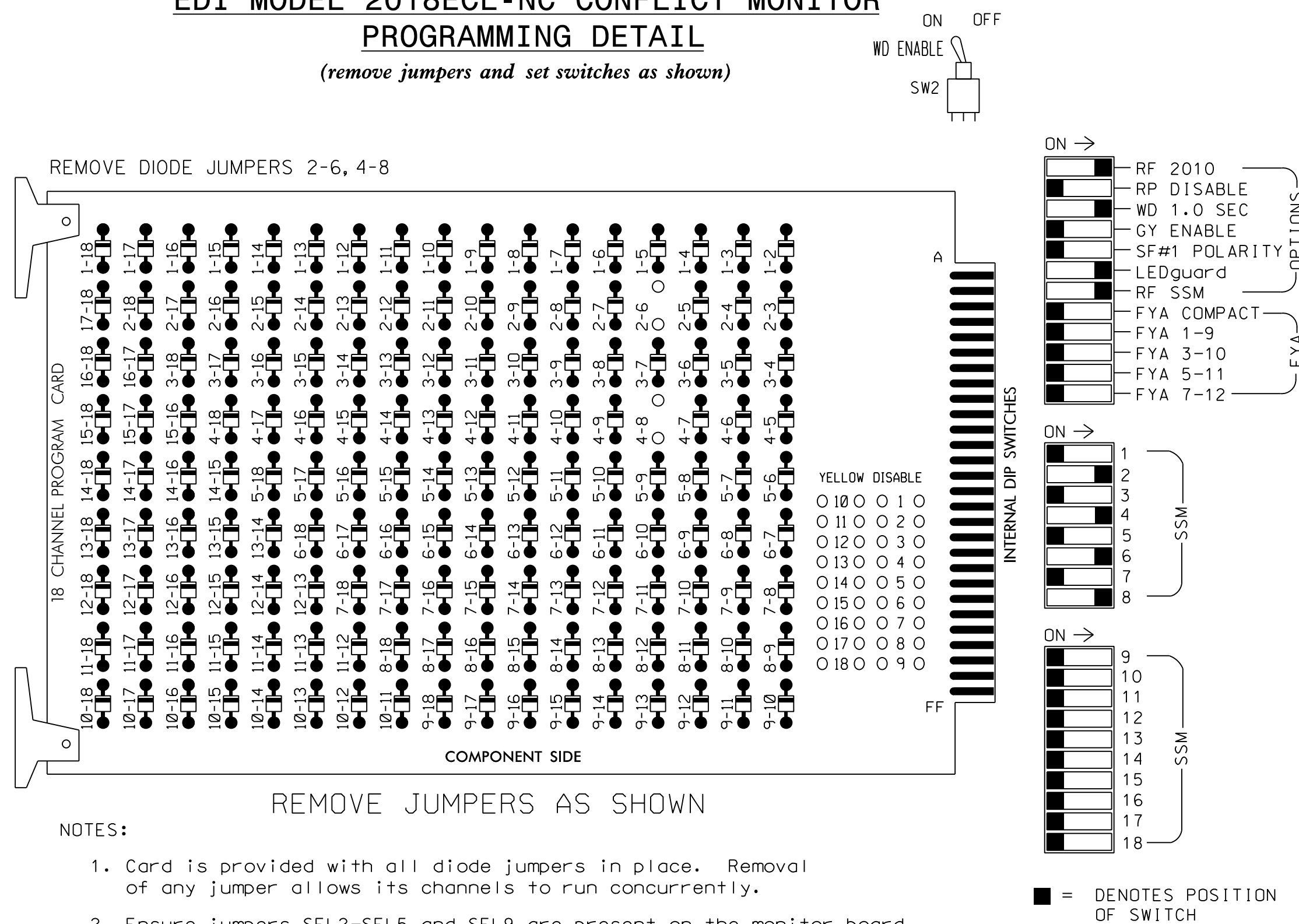
REVISIONS	INIT.	DATE

Seal of David T. Sears, Professional Engineer, State of North Carolina, License No. 044558. Date: 2/7/2020.



EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

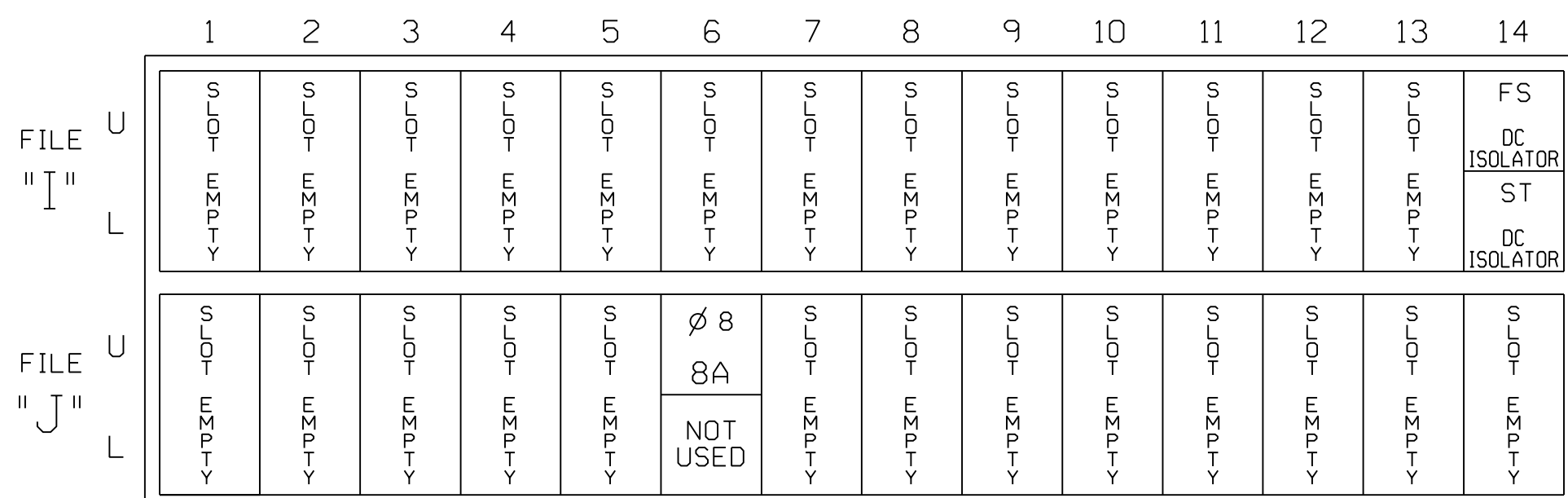
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,43	NU	NU	61,62	NU	NU	81,82,83	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

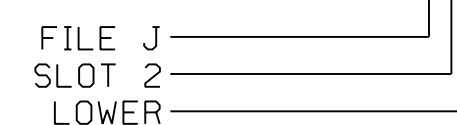
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 2D, 2E, 4A, 4B, 6A, 6B, and 6C install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

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ELECTRICAL DETAIL - TEMPORARY DESIGN 1

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US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS INIT. DATE

INIT. DATE

2/7/2020

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS

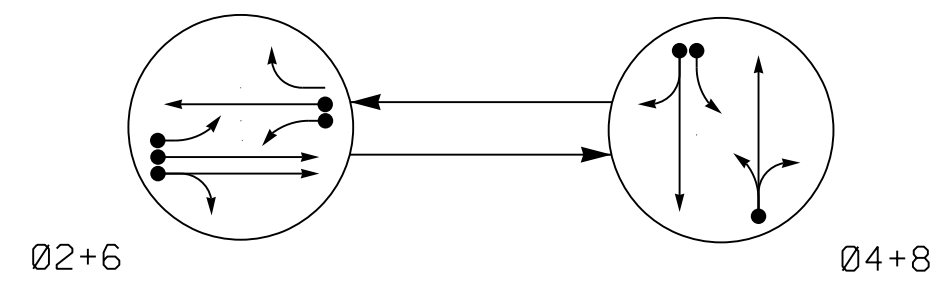
DocuSigned by David T. Sears 2/7/2020

SEAL 044558

SIGNATURE DATE

SIG. INVENTORY NO. 11-0009T1

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

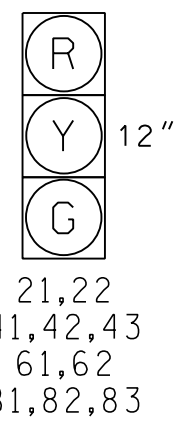
- DETECTED MOVEMENT
- ◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄--- UNSIGNALIZED MOVEMENT
- ◄---> PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21,22	G	R	Y
41,42,43	R	G	R
61,62	G	R	Y
81,82,83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

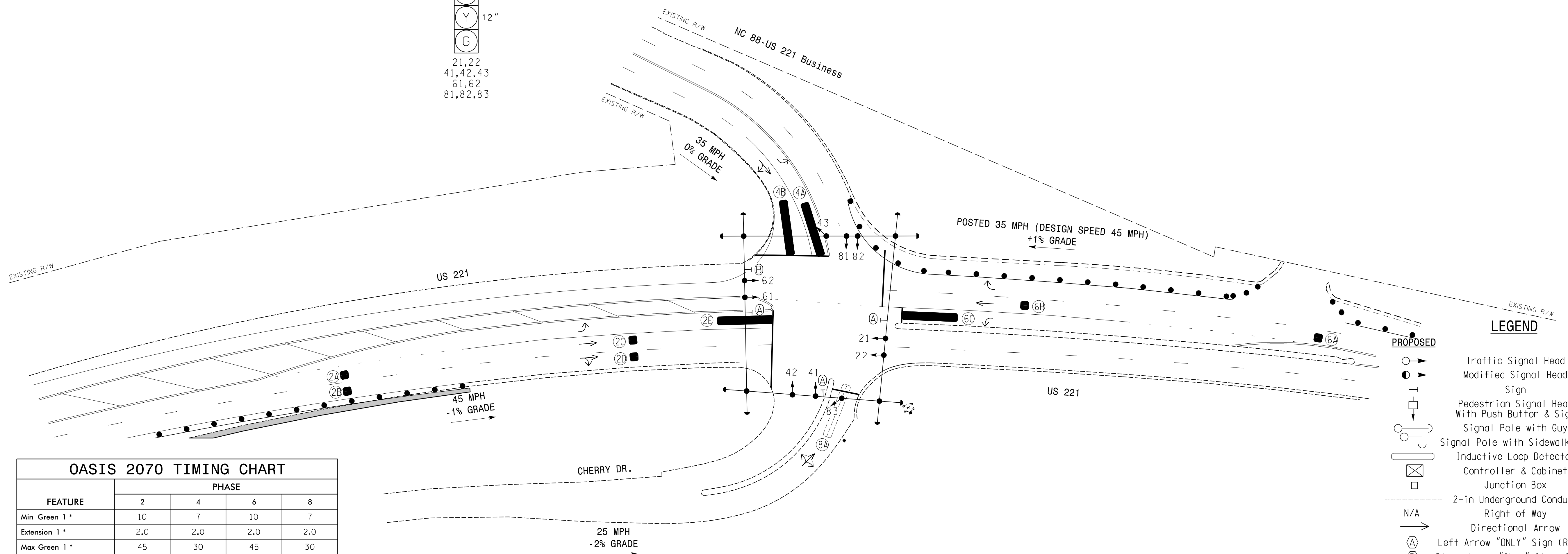
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD
					PHASE	CALLING	EXTENSION	FULL TIME DELAY				
2A	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2C	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2D	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2E	6X40	0	*	*	2	Y	Y	-	-	-	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	3	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	15	-	*
6A	6X6	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	6X6	90	*	*	6	Y	Y	-	-	-	-	*
6C	6X40	0	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	-

* Video Detection

2 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
- THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	30	45	30
Yellow Clearance	4.6	3.8	4.6	3.8
Red Clearance	1.3	2.8	1.3	2.8
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|----|---------------------------------|---|-----|
| ○ | Traffic Signal Head | ● | N/A |
| ○→ | Modified Signal Head | ○ | N/A |
| ○ | Sign | ○ | N/A |
| ○ | Pedestrian Signal Head | ○ | N/A |
| ○ | With Push Button & Sign | ○ | N/A |
| ○ | Signal Pole with Guy | ○ | N/A |
| ○ | Signal Pole with Sidewalk Guy | ○ | N/A |
| ○ | Inductive Loop Detector | ○ | N/A |
| ○ | Controller & Cabinet | ○ | N/A |
| ○ | Junction Box | ○ | N/A |
| ○ | 2-in Underground Conduit | ○ | N/A |
| ○ | Right of Way | ○ | N/A |
| ○ | Directional Arrow | ○ | N/A |
| ○ | Left Arrow "ONLY" Sign (R3-5L) | ○ | N/A |
| ○ | Right Arrow "ONLY" Sign (R3-5R) | ○ | N/A |
| ○ | Video Detection Area | ○ | N/A |
| ○ | Construction Zone | ○ | N/A |
| ○ | Construction Zone Drums | ○ | N/A |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE - TEMPORARY DESIGN 2 - CONSTRUCTION PHASE III

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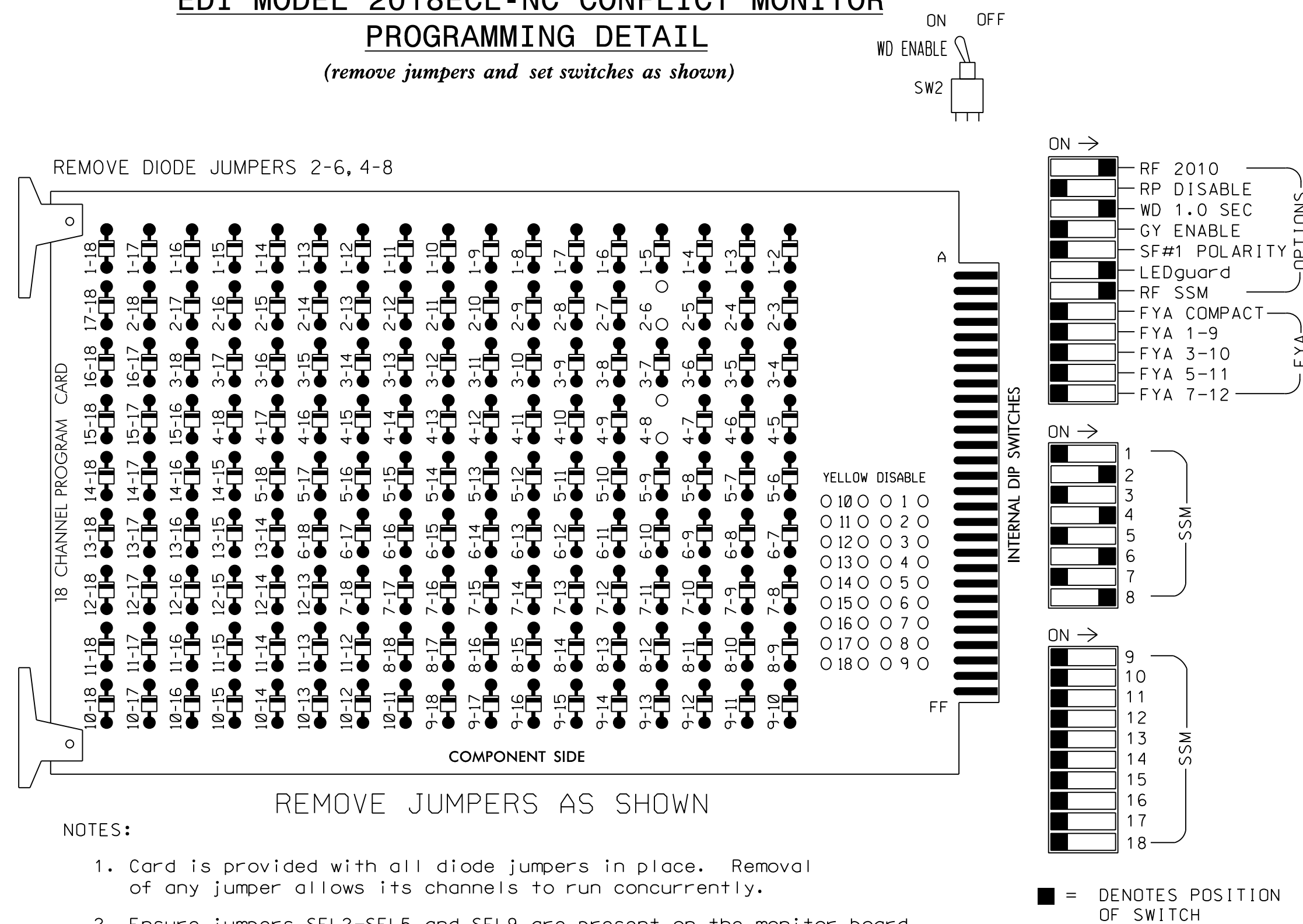
Prepared for:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 SIGNAL DESIGN SECTION
 750 N. Greenfield Pkwy, Garner, NC 27529

US 221
 AT
 NC 88-US 221 BUSINESS /
 CHERRY DR.
 DIVISION 11 ASHE CO. JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS INIT. DATE
 SCALE 0 40
 1" = 40'

SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. II-0009T2

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

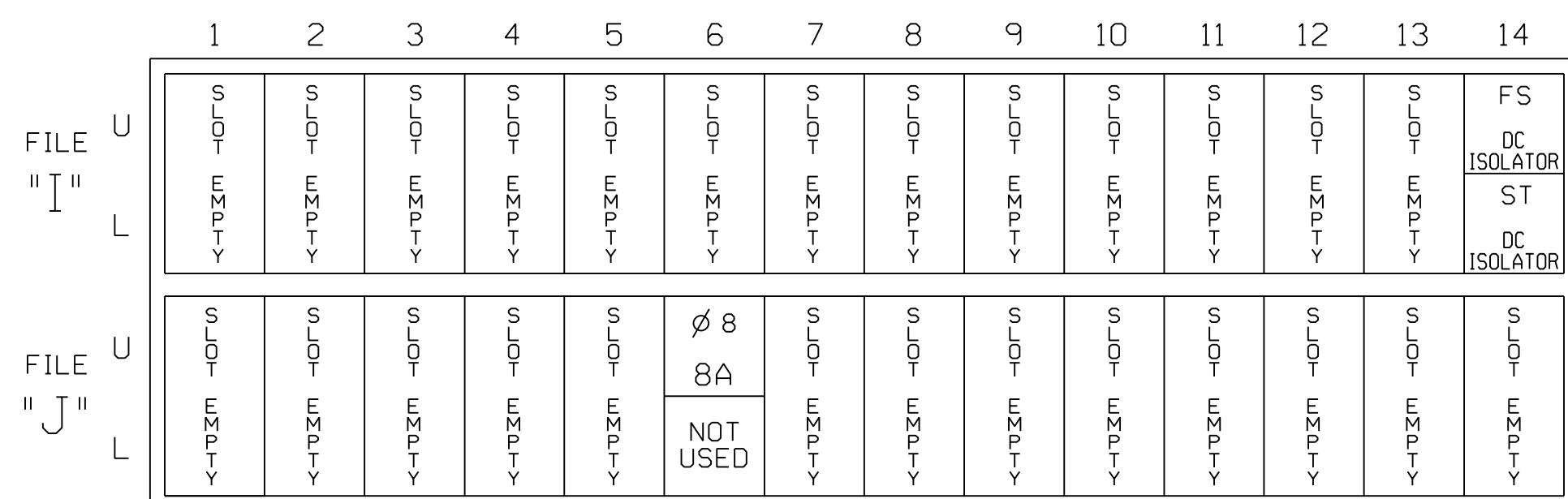
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42, 43	NU	NU	61,62	NU	NU	81,82, 83	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

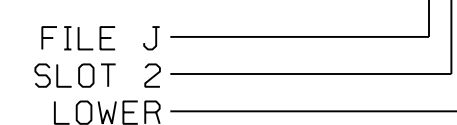
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



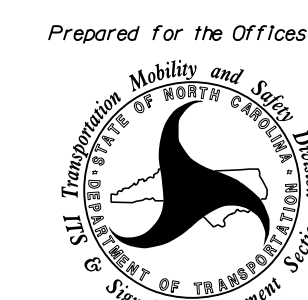
SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 2D, 2E, 4A, 4B, 6A, 6B, and 6C install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0009T2
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

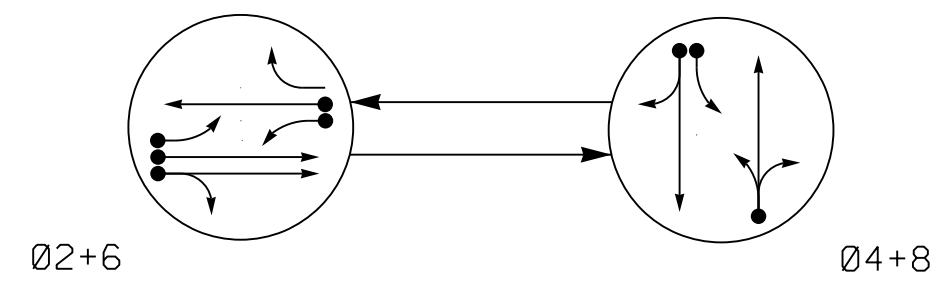
US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.	
DIVISION 11 ASHE COUNTY	JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

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SEAL	DATE
DAVID J. SEARS	2/7/2020
SIGNATURE	DATE

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PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

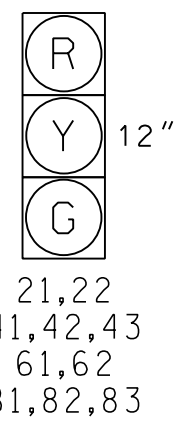
- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←--- UNSIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21,22	G	R	Y
41,42,43	R	G	R
61,62	G	R	Y
81,82,83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

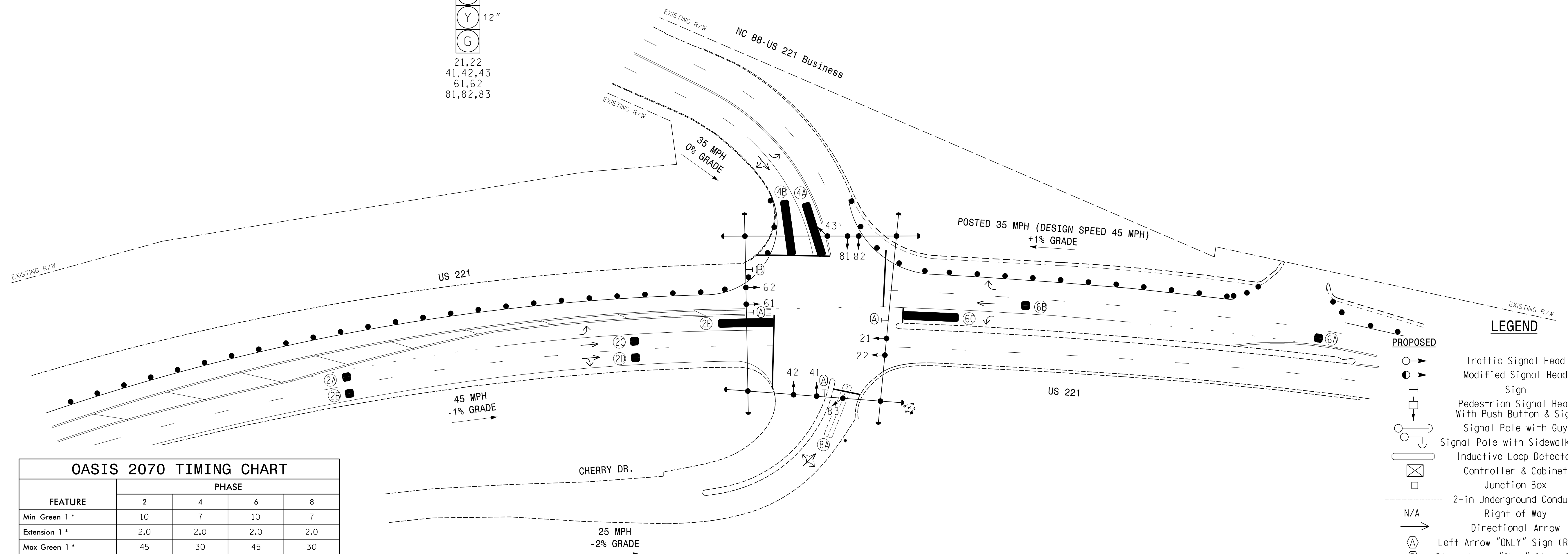
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	STRETCH FULL TIME DELAY	DELAY TIME			
2A	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2C	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2D	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2E	6X40	0	*	*	2	Y	Y	-	-	-	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	3	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	15	-	*
6A	6X6	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	6X6	90	*	*	6	Y	Y	-	-	-	-	*
6C	6X40	0	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	-

* Video Detection

2 PHASE FULLY ACTUATED (ISOLATED)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. REPOSITION EXISTING SIGNAL HEADS NUMBERED 61 AND 62.
4. SET ALL DETECTOR UNITS TO PRESENCE MODE.
5. INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
6. THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	30	45	30
Yellow Clearance	4.6	3.8	4.6	3.8
Red Clearance	1.3	2.8	1.3	2.5
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|-----|--|-----|---|
| ○ | Traffic Signal Head | ● | EXISTING Traffic Signal Head |
| ○ | Modified Signal Head | N/A | EXISTING Modified Signal Head |
| □ | Sign | □ | EXISTING Sign |
| □ | Pedestrian Signal Head With Push Button & Sign | □ | EXISTING Pedestrian Signal Head With Push Button & Sign |
| □ | Signal Pole with Guy | □ | EXISTING Signal Pole with Guy |
| □ | Signal Pole with Sidewalk Guy | □ | EXISTING Signal Pole with Sidewalk Guy |
| □ | Inductive Loop Detector | □ | EXISTING Inductive Loop Detector |
| □ | Controller & Cabinet | □ | EXISTING Controller & Cabinet |
| □ | Junction Box | □ | EXISTING Junction Box |
| □ | 2-in Underground Conduit | □ | EXISTING 2-in Underground Conduit |
| N/A | Right of Way | --- | EXISTING Right of Way |
| → | Directional Arrow | → | EXISTING Directional Arrow |
| Ⓐ | Left Arrow "ONLY" Sign (R3-5L) | Ⓐ | EXISTING Left Arrow "ONLY" Sign (R3-5L) |
| Ⓑ | Right Arrow "ONLY" Sign (R3-5R) | Ⓑ | EXISTING Right Arrow "ONLY" Sign (R3-5R) |
| ■ | Video Detection Area | ■ | EXISTING Video Detection Area |
| ■ | Construction Zone | ■ | EXISTING Construction Zone |
| ● | Construction Zone Drums | ● | EXISTING Construction Zone Drums |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SIGNAL UPGRADE - TEMPORARY DESIGN 3 - CONSTRUCTION PHASE IV

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Prepared for:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 221
 AT
 NC 88-US 221 BUSINESS /
 CHERRY DR.
 DIVISION 11 ASHE CO. JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: _____ INIT. DATE

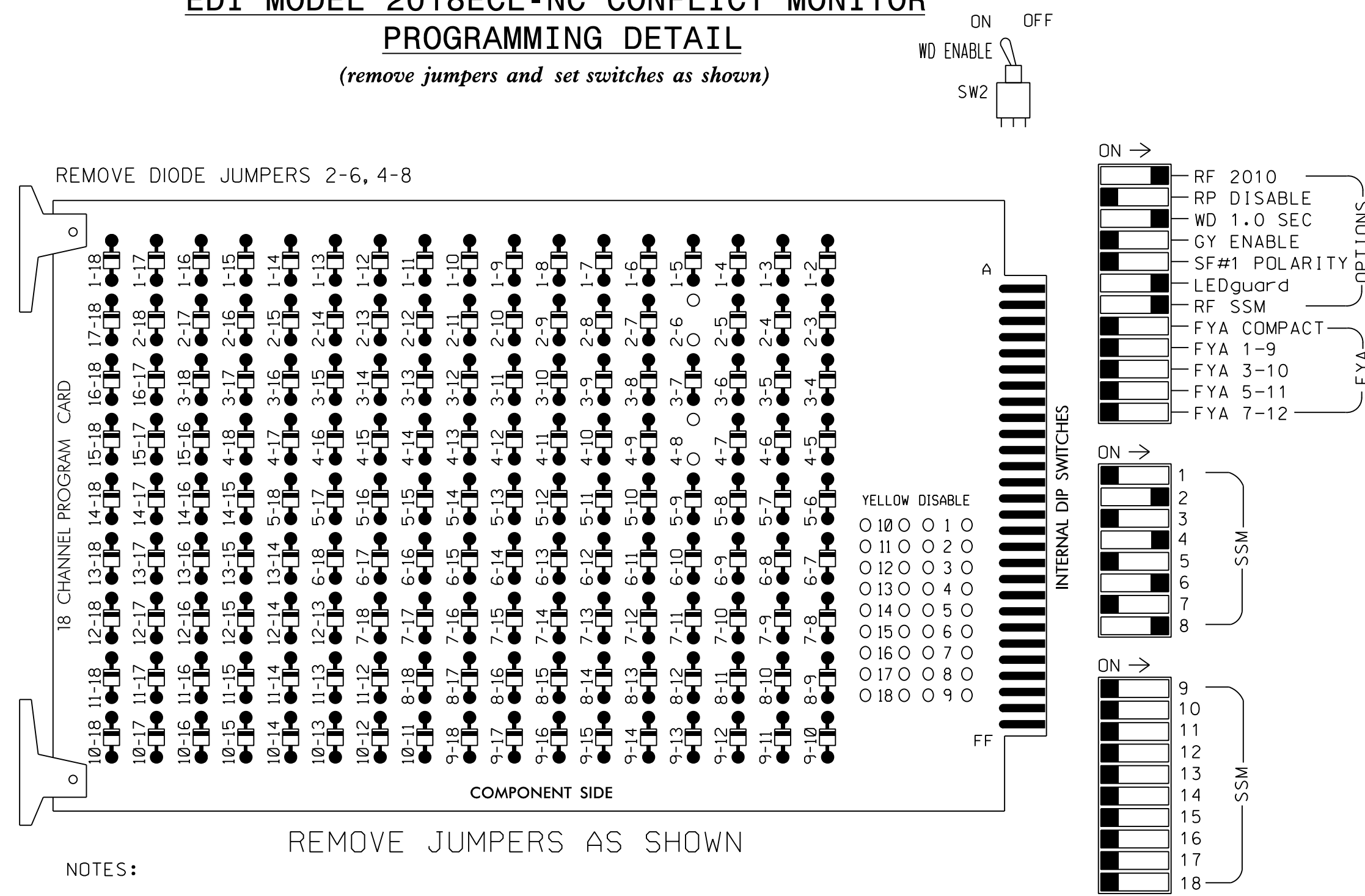
SEAL

 David T. Sears
 2/7/2020
 SIGNATURE DATE

 SIG. INVENTORY NO. II-0009T3

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all Phases.
4. Program phases 2 and 6 for Startup In Green.
5. Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

PROJECT REFERENCE NO.	SHEET NO.
R-2915E	Sig. 19.1

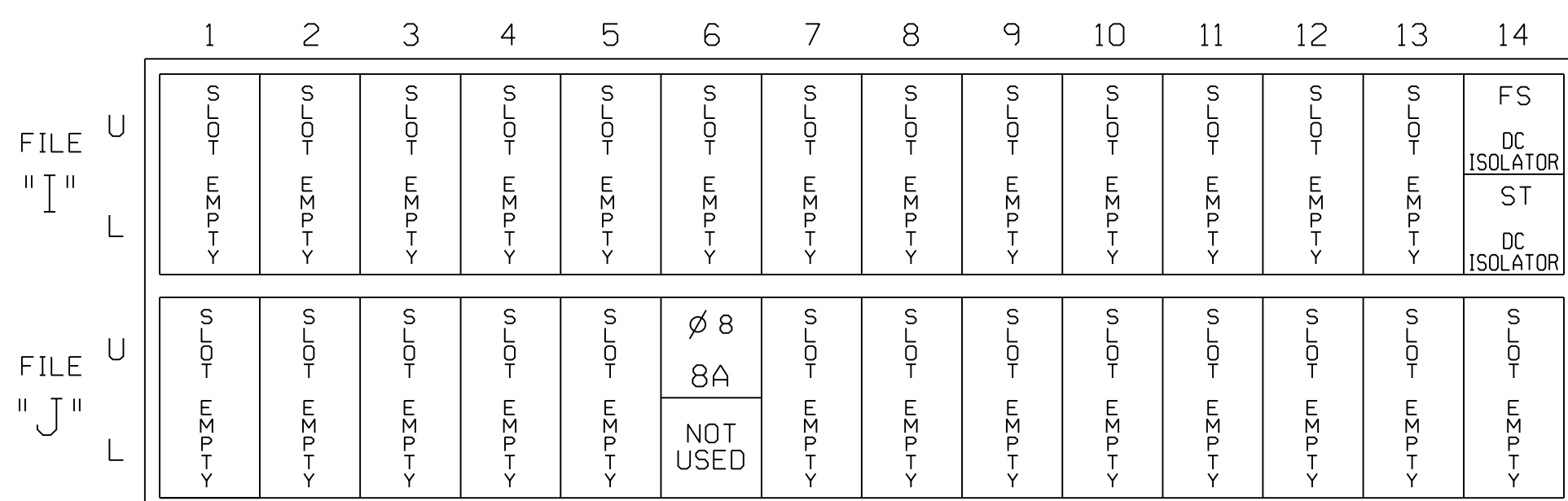
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,43	NU	NU	61,62	NU	NU	81,82,83	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

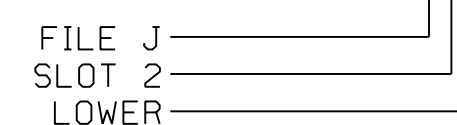
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



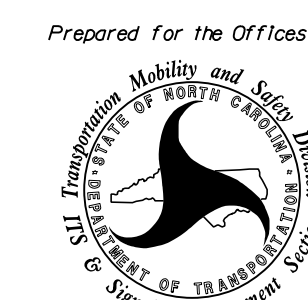
SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 2D, 2E, 4A, 4B, 6A, 6B, and 6C install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0009T3
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - TEMPORARY DESIGN 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:



750 N. Greenfield Pkwy, Garner, NC 27529

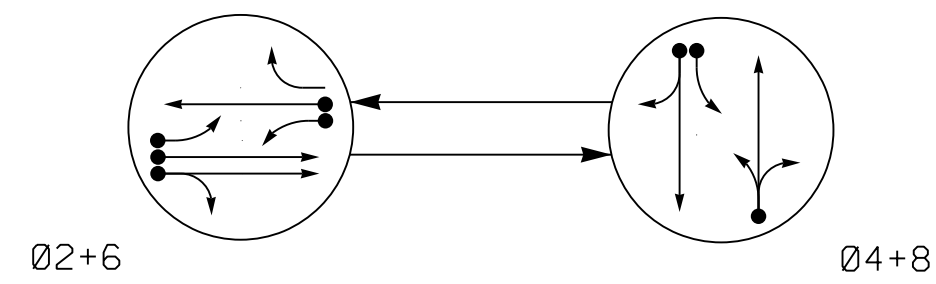
US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.	
DIVISION 11 ASHE COUNTY	JEFFERSON
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL	DATE
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044558	2/7/2020
DAVID T. SEARS	
SIGNATURE	DATE
SIG. INVENTORY NO. 11-0009T3	

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PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

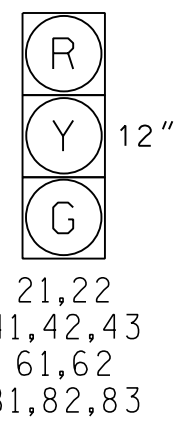
- ←● DETECTED MOVEMENT
- ← UNDETECTED MOVEMENT (OVERLAP)
- ←--- UNSIGNALIZED MOVEMENT
- ←--- PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE		
	02+6	04+8	FLASH
21,22	G	R	Y
41,42,43	R	G	R
61,62	G	R	Y
81,82,83	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.



OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

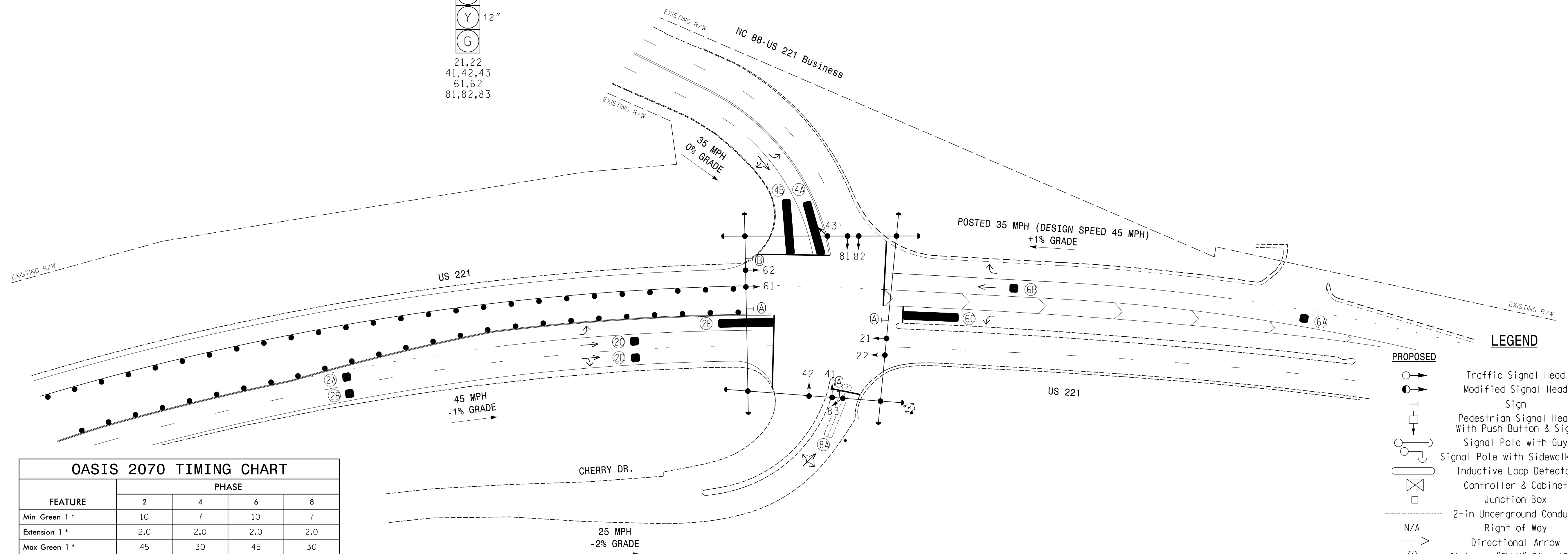
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING					SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	STRETCH FULL TIME DELAY	DELAY TIME			
2A	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2B	6X6	300	*	*	2	Y	Y	-	1.6	-	-	*
2C	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2D	6X6	90	*	*	2	Y	Y	-	-	-	-	*
2E	6X40	0	*	*	2	Y	Y	-	-	-	-	*
4A	6X40	0	*	*	4	Y	Y	-	-	3	-	*
4B	6X40	0	*	*	4	Y	Y	-	-	15	-	*
6A	6X6	300	*	*	6	Y	Y	-	1.6	-	-	*
6B	6X6	90	*	*	6	Y	Y	-	-	-	-	*
6C	6X40	0	*	*	6	Y	Y	-	-	-	-	*
8A	6X40	+5	2-4-2	-	8	Y	Y	-	-	10	-	-

* Video Detection

2 PHASE FULLY ACTUATED (ISOLATED)

NOTES

1. REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
3. REPOSITION EXISTING SIGNAL HEADS NUMBERED 61 AND 62.
4. SET ALL DETECTOR UNITS TO PRESENCE MODE.
5. INCORPORATE LOOP EMULATOR DETECTION SYSTEM FOR VEHICLE DETECTION.
6. THE CONTRACTOR SHALL LOCATE CAMERAS AND MODIFY THE DETECTION ZONE LOCATIONS PER THE MANUFACTURER'S INSTRUCTIONS TO ACCOMPLISH THE DETECTION SCHEME SHOWN.



OASIS 2070 TIMING CHART

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	10	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0
Max Green 1 *	45	30	45	30
Yellow Clearance	4.6	3.8	4.6	3.8
Red Clearance	1.3	2.8	1.3	2.9
Red Revert	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	-	-	-	-
Max Variable Initial *	-	-	-	-
Time Before Reduction *	-	-	-	-
Time To Reduce *	-	-	-	-
Minimum Gap	-	-	-	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|--|---|--|------------------------------|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | N/A |
| | Proposed Pedestrian Signal Head | | N/A |
| | Proposed Signal Pole with Guy | | N/A |
| | Proposed Inductive Loop Detector | | N/A |
| | Proposed Controller & Cabinet | | N/A |
| | Proposed Junction Box | | N/A |
| | Proposed 2-in Underground Conduit | | N/A |
| | N/A Right of Way | | N/A |
| | Proposed Directional Arrow | | N/A |
| | Proposed Left Arrow "ONLY" Sign (R3-5L) | | N/A |
| | Proposed Video Detection Area | | N/A |
| | Proposed Construction Zone Drums | | N/A |

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SIGNAL UPGRADE - TEMPORARY DESIGN 4 - CONSTRUCTION PHASE V

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Prepared for:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 221
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 DIVISION 11 ASHE CO. JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: _____ INIT. DATE

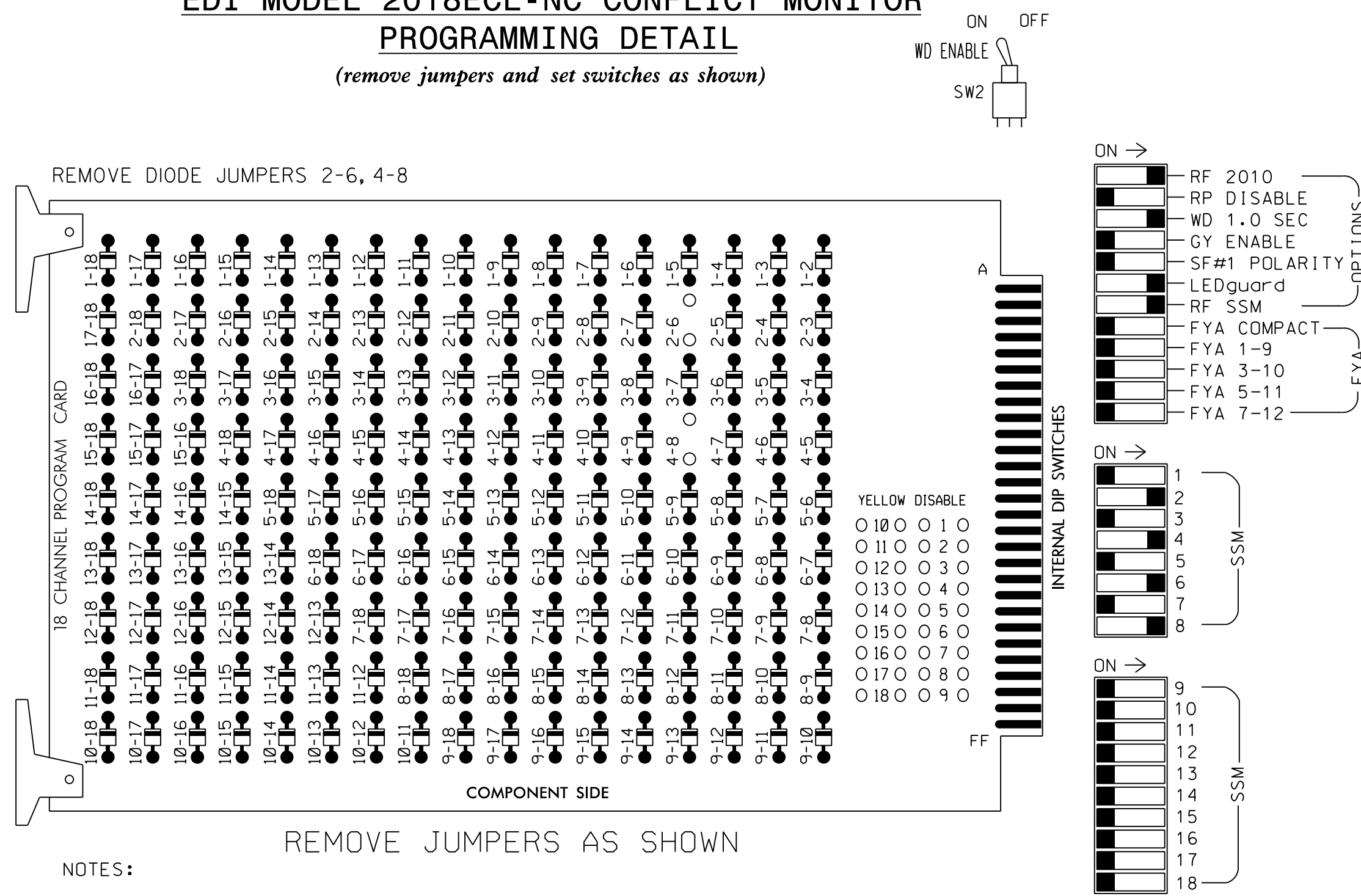
SEAL

 David T. Sears
 2/7/2020
 SIGNATURE DATE

 SIG. INVENTORY NO. II-0009T4

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phases 2 and 6 for Yellow Flash.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S8,S11
 PHASES USED.....2,4,6,8
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....NOT USED
 OVERLAP "D".....NOT USED

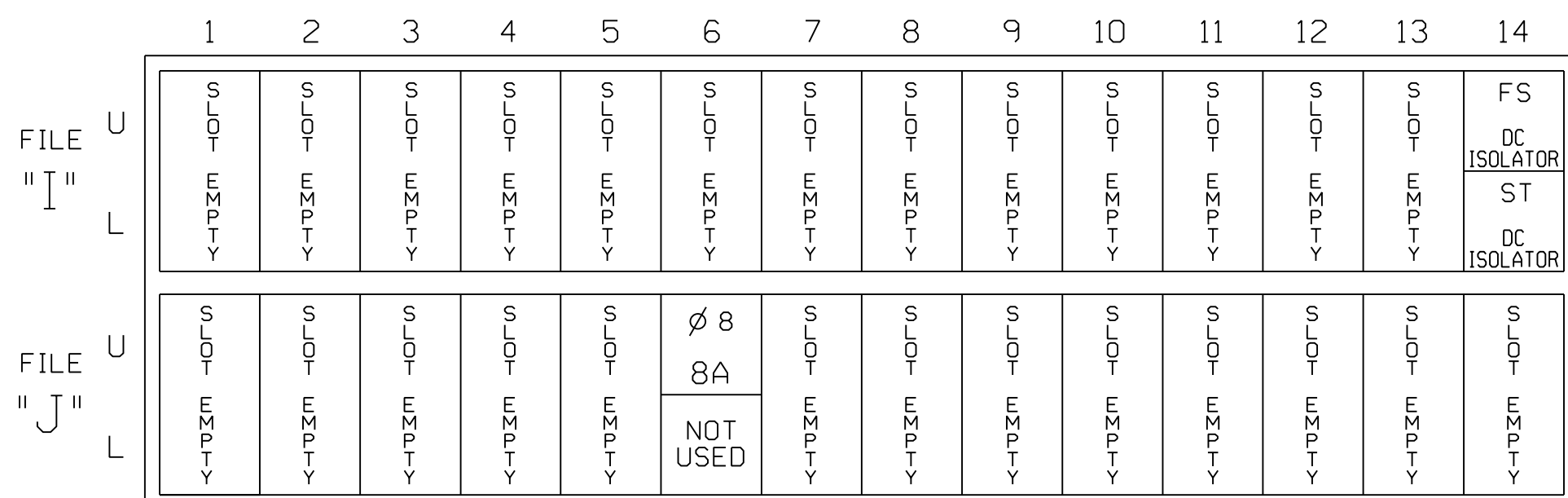
SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42, 43	NU	NU	61,62	NU	NU	81,82, 83	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																		
YELLOW ARROW																		
GREEN ARROW																		

NU = Not Used

INPUT FILE POSITION LAYOUT

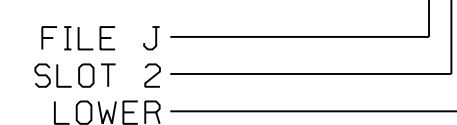
(front view)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



SPECIAL DETECTOR NOTE

For zones 2A, 2B, 2C, 2D, 2E, 4A, 4B, 6A, 6B, and 6C install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

ELECTRICAL DETAIL - TEMPORARY DESIGN 4

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

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 NC 88-US 221 BUSINESS /
 CHERRY DR.

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS	INIT.	DATE

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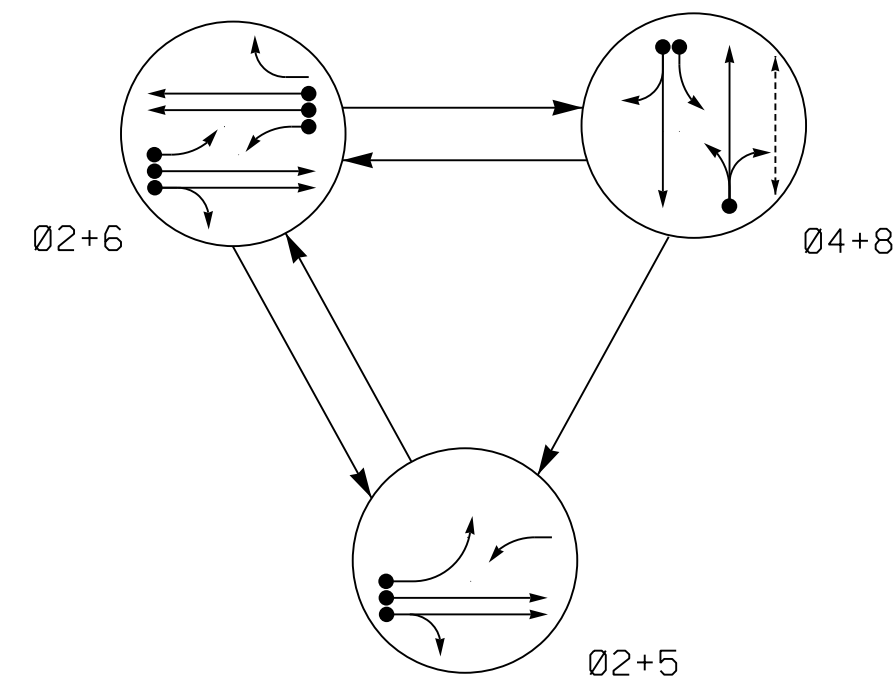
SEAL

David T. Sears 2/7/2020

SIGNATURE DATE

SIG. INVENTORY NO. 11-0009T4

PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

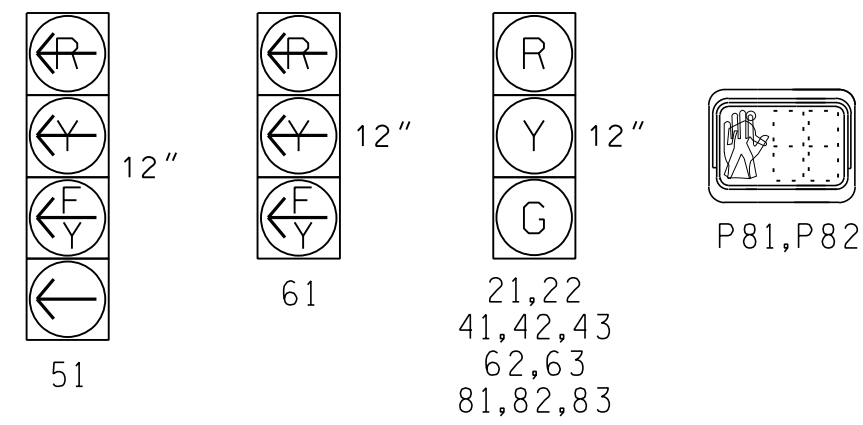
- DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- - - UNSIGNALIZED MOVEMENT
- ⬅️ PEDESTRIAN MOVEMENT

TABLE OF OPERATION

SIGNAL FACE	PHASE			
	02+5	02+6	04+8	FLASH
21,22	G	G	R	Y
41,42,43	R	R	G	R
51	-	F	R	-Y
61	-	F	R	-Y
62,63	R	G	R	Y
81,82,83	R	R	G	R
P81,P82	DW	DW	W	DRK

SIGNAL FACE I.D.

All Heads L.E.D.



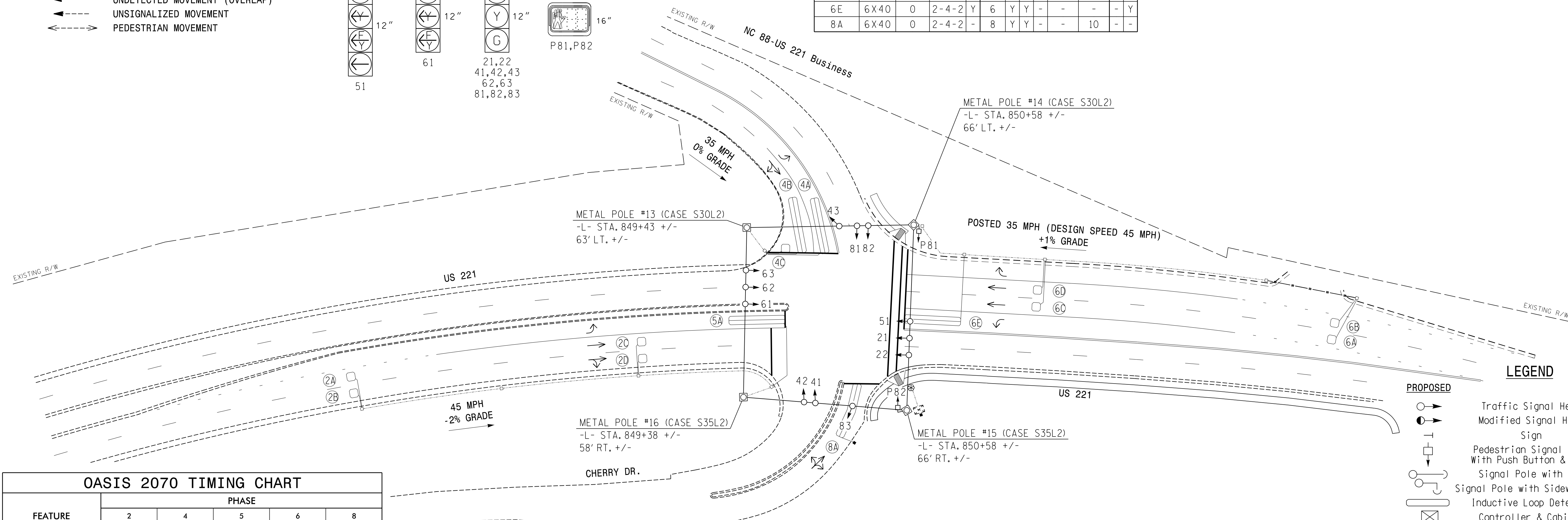
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING							
					PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM LOOP	NEW CARD	
2A	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	1.6	-	-	Y
2C	6X6	90	4	Y	2	Y	Y	-	-	-	-	Y
2D	6X6	90	4	Y	2	Y	Y	-	-	-	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	-	3	-	Y
4B	6X40	0	2-4-2	Y	4	Y	Y	-	-	10	-	Y
4C	6X6	0	4	Y	4	Y	Y	-	-	15	-	Y
5A	6X40	0	2-4-2	Y	5	Y	Y	-	-	15	-	Y
6A	6X6	300	6	Y	6	Y	Y	-	1.6	-	-	Y
6B	6X6	300	6	Y	6	Y	Y	-	1.6	-	-	Y
6C	6X6	90	4	Y	6	Y	Y	-	-	-	-	Y
6D	6X6	90	4	Y	6	Y	Y	-	-	-	-	Y
6E	6X40	0	2-4-2	Y	6	Y	Y	-	-	-	-	Y
8A	6X40	0	2-4-2	-	8	Y	Y	-	-	10	-	-

3 PHASE FULLY ACTUATED (ISOLATED)

NOTES

- REFER TO "ROADWAY STANDARD DRAWINGS NCDOT" DATED JANUARY 2018 AND "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
- DO NOT PROGRAM SIGNAL FOR LATE NIGHT FLASHING OPERATION UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
- PHASE 5 MAY BE LAGGED.
- SET ALL DETECTOR UNITS TO PRESENCE MODE.
- OMIT "WALK" AND FLASHING "DON'T WALK" WITH NO PEDESTRIAN CALLS.
- PROGRAM PEDESTRIAN HEADS TO COUNTDOWN THE FLASHING "DON'T WALK" TIME ONLY.



OASIS 2070 TIMING CHART

FEATURE	PHASE				
	2	4	5	6	8
Min Green 1 *	10	7	7	10	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	45	30	20	45	30
Yellow Clearance	4.7	3.8	3.0	4.7	3.8
Red Clearance	1.4	2.6	2.3	1.4	2.6
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	-	-	-	7
Don't Walk 1	-	-	-	-	26
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	MIN RECALL	-	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	-	YELLOW	-
Dual Entry	-	ON	-	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

LEGEND

- | | | | |
|--|--|--|--|
| | Proposed Traffic Signal Head | | Existing Traffic Signal Head |
| | Proposed Modified Signal Head | | Existing Modified Signal Head |
| | Proposed Pedestrian Signal Head | | Existing Pedestrian Signal Head |
| | Proposed Signal Pole with Guy | | Existing Signal Pole with Guy |
| | Proposed Signal Pole with Sidewalk Guy | | Existing Signal Pole with Sidewalk Guy |
| | Proposed Inductive Loop Detector | | Existing Inductive Loop Detector |
| | Proposed Controller & Cabinet | | Existing Controller & Cabinet |
| | Proposed Junction Box | | Existing Junction Box |
| | Proposed 2-in Underground Conduit | | Existing 2-in Underground Conduit |
| | Proposed Right of Way | | Existing Right of Way |
| | Proposed Directional Arrow | | Existing Directional Arrow |
| | Proposed Metal Strain Pole | | Existing Metal Strain Pole |
| | Proposed Type I Pushbutton Post | | Existing Type I Pushbutton Post |

SIGNAL UPGRADE - FINAL DESIGN

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 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 STREET OF EXCELLENCE
 Signal Design Section

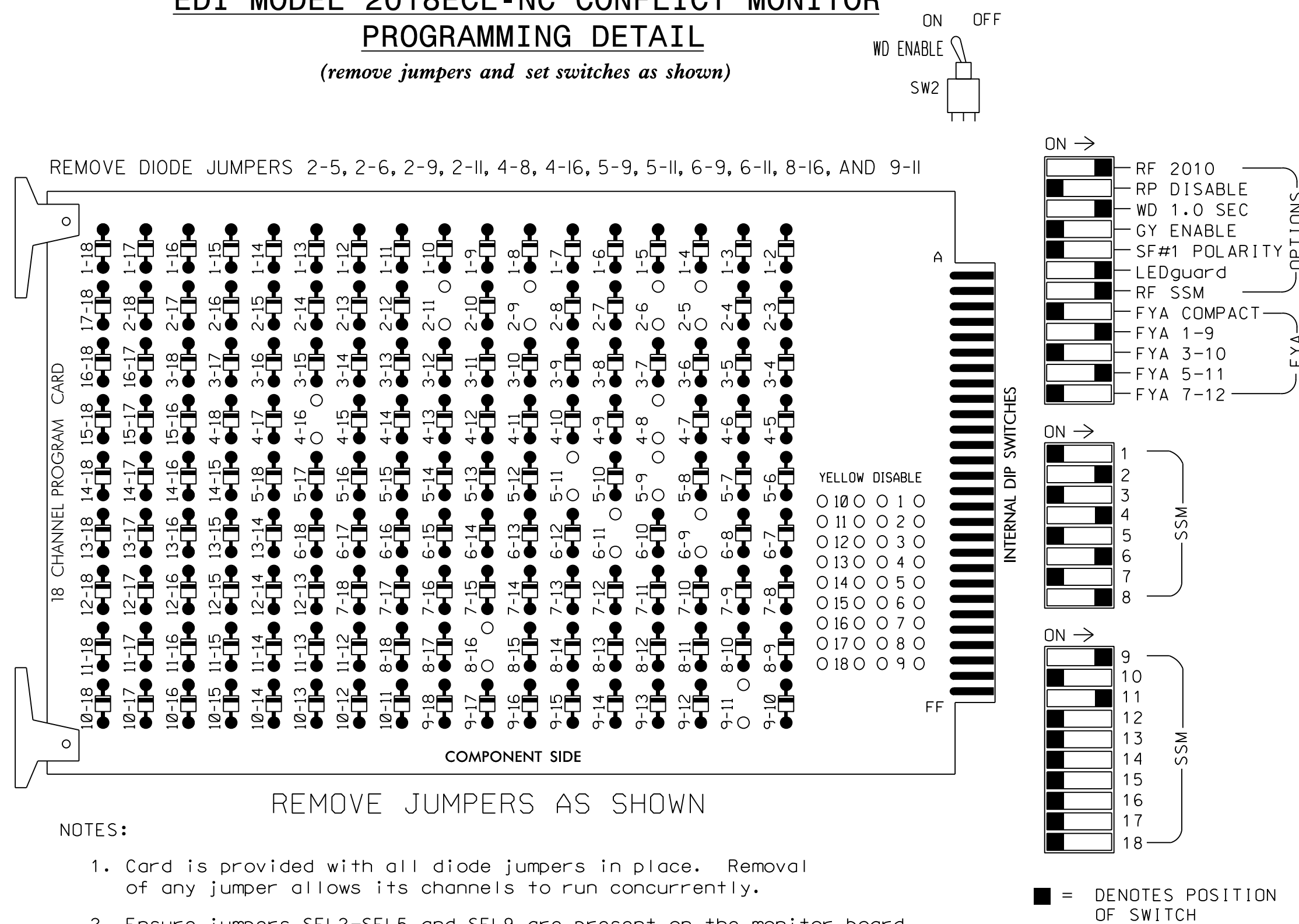
US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.
 DIVISION 11 ASHE CO. JEFFERSON
 PLAN DATE: FEBRUARY 2020 REVIEWED BY: CBHOLDEN
 PREPARED BY: DTSEARS REVIEWED BY:
 REVISIONS: INIT. DATE

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 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 044558
 DAVID T. SEARS
 2/7/2020
 SIGNATURE DATE
 SIG. INVENTORY NO. 11-0009

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- REMOVE JUMPERS AS SHOWN
- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
 - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
 - Ensure that Red Enable is active at all times during normal operation.
 - Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all Phases.
- Program phases 2 and 6 for Startup In Green.
- Program phase 8 for Startup Ped Call.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.

EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S2,S5,S7,S8,S11,S12,AUX S1,AUX S4
 PHASES USED.....2,4,5,6,8,8PED
 OVERLAP "A".....2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42,43	NU	51	62,63	NU	NU	81,82,83	P81, P82	61	NU	NU	51	NU	NU
RED	128				101			134			107							
YELLOW	129				102		*	135			108							
GREEN	130				103			136			109							
RED ARROW														A121			A114	
YELLOW ARROW														A122			A115	
FLASHING YELLOW ARROW														A123			A116	
GREEN ARROW								133										
Hand icon												110						
Person icon												112						

NU = Not Used
 * Denotes install load resistor. See load resistor installation detail this sheet.
 ★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 2	∅ 2	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	2A	2C	2D	4A	4C	4B	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
U	∅ 5	∅ 6	∅ 6	∅ 6	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8	∅ 8
L	5A	6A	6C	6E	8A	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED
U	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6	∅ 6
L	6B	6D	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED	NOT USED

EX.: 1A, 2A, ETC. = LOOP NO.'S
 FS = FLASH SENSE
 ST = STOP TIME

⊗ Wired Input - Do not populate slot with detector card

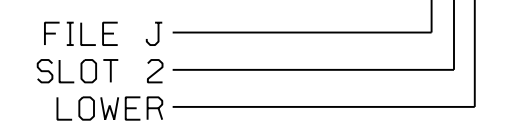
INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y		1.6	
2B	TB2-7,8	I2L	43	5	12	2	Y	Y		1.6	
2C	TB2-9,10	I3U	63	25	32	2	Y	Y			
2D	TB2-11,12	I3L	76	38	42	2	Y	Y			
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			10
4C	TB6-1,2	I7U	65	27	34	4	Y	Y			15
5A ¹	TB3-1,2	J1U	55	17	5	5	Y	Y			15
		I4U	47	9	22	2	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y		1.6	
6B	TB3-7,8	J2L	44	6	16	6	Y	Y		1.6	
6C	TB3-9,10	J3U	64	26	36	6	Y	Y			
6D	TB3-11,12	J3L	77	39	46	6	Y	Y			
6E	TB5-1,2	J4U	48	10	26	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10
PED PUSH BUTTONS											
P81,P82	TB8-8,9	I13L	70	32		PED 8	8 PED				

¹Add jumper from J1-W to I4-W, on rear of input file.

NOTE:
 INSTALL DC ISOLATORS IN INPUT FILE SLOT I13.

INPUT FILE POSITION LEGEND: J2L

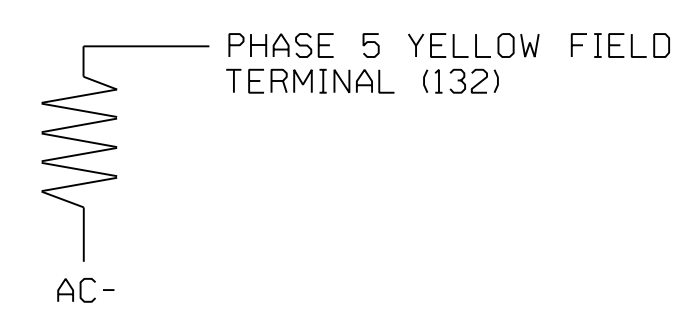


LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

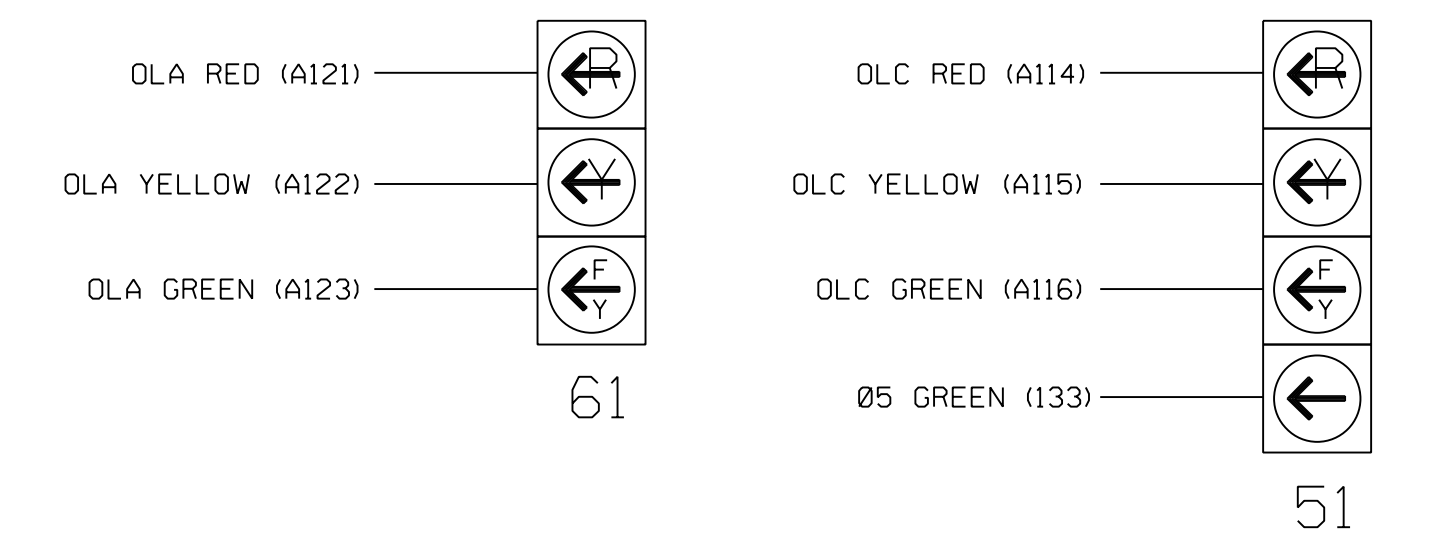
ACCEPTABLE VALUES

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE
 The sequence display for signal head 51 requires special logic programming. See sheet 2 for programming instructions.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 11-0009
 DESIGNED: FEBRUARY 2020
 SEALED: FEBRUARY 7, 2020
 REVISED:

ELECTRICAL DETAIL - FINAL DESIGN - SHEET 1 OF 2

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 044558 DAVID T. SEARS

US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.

DIVISION 11 ASHE COUNTY JEFFERSON

PLAN DATE: FEBRUARY 2020 REVIEWED BY: D. SEARS

PREPARED BY: W.P. JONES REVIEWED BY:

REVISIONS INIT. DATE

Prepared for the Offices of:
 Mobility and Traffic Division
 STATE OF NORTH CAROLINA
 Department of Transportation

750 N. Greenfield Pkwy, Garner, NC 27529

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 8801 Six Forks Road Suite 700 | Raleigh, North Carolina 27615-2965
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DocuSigned by:
 David T. Sears
 2/7/2020

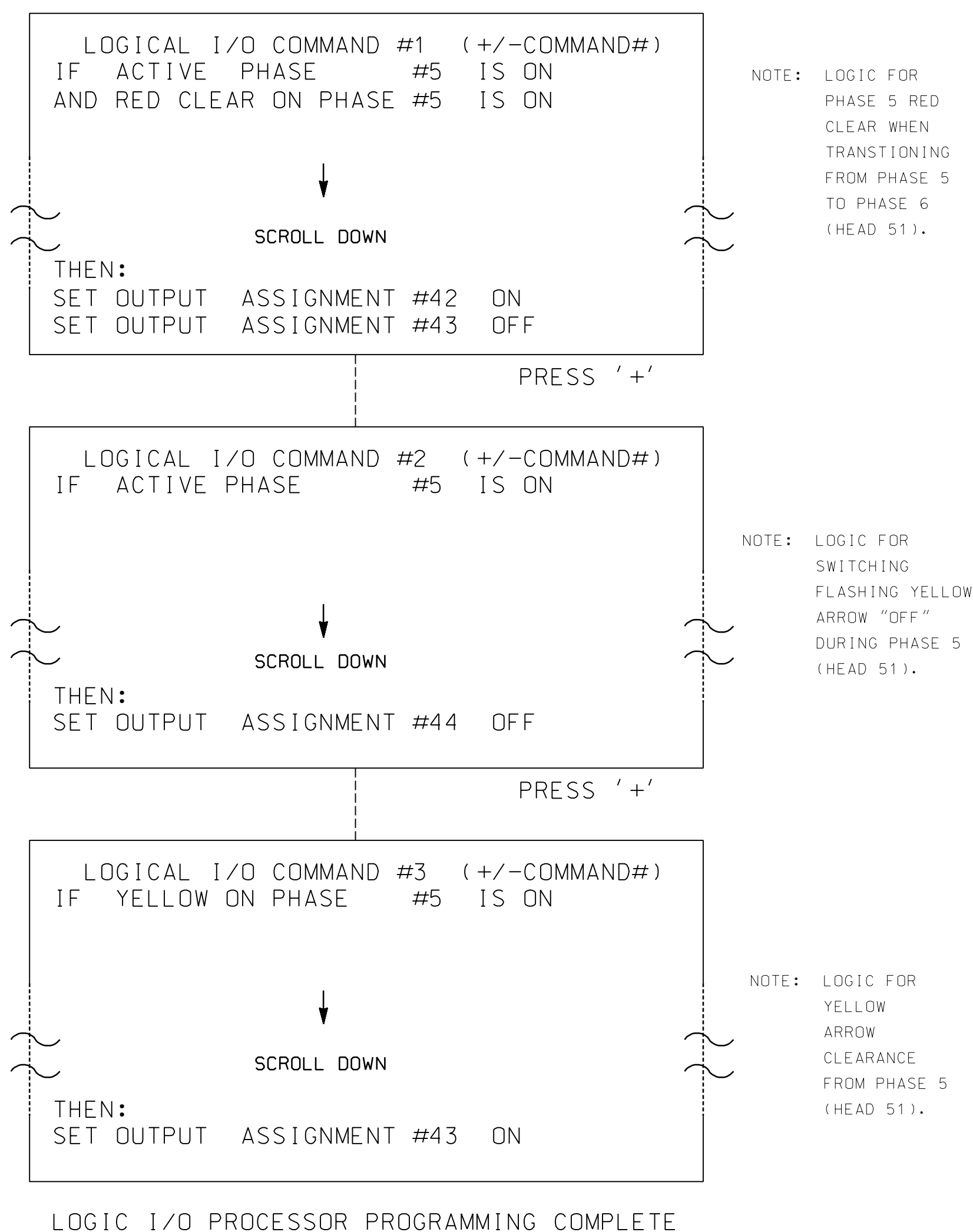
SIGNATURE DATE

SIG. INVENTORY NO. 11-0009

LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2, AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



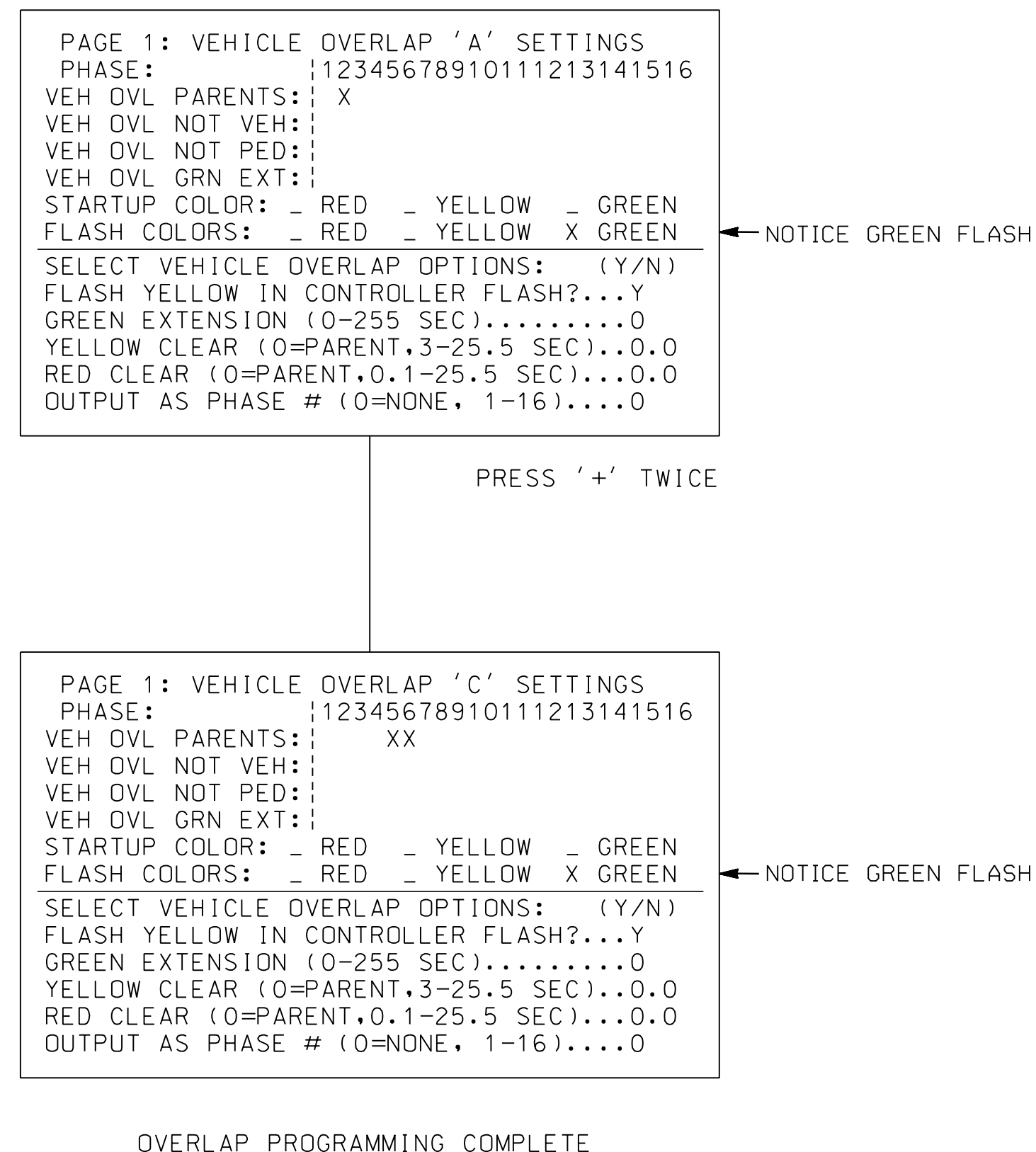
OUTPUT REFERENCE SCHEDULE

OUTPUT 42 = Overlap C Red
OUTPUT 43 = Overlap C Yellow
OUTPUT 44 = Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

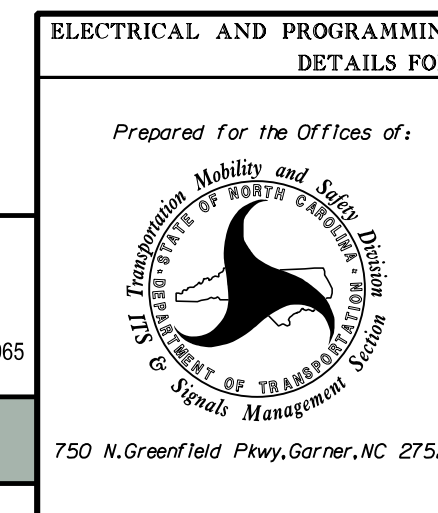
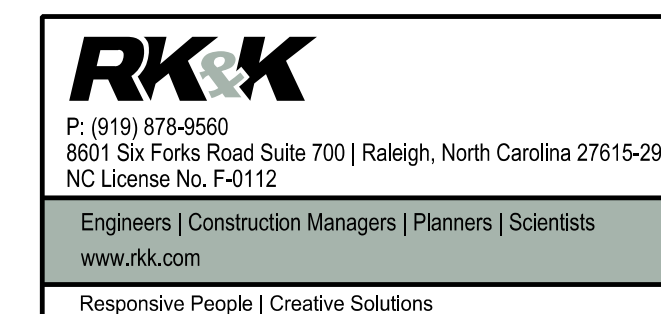
FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).



THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 11-0009
DESIGNED: FEBRUARY 2020
SEALED: FEBRUARY 7, 2020
REVISED:

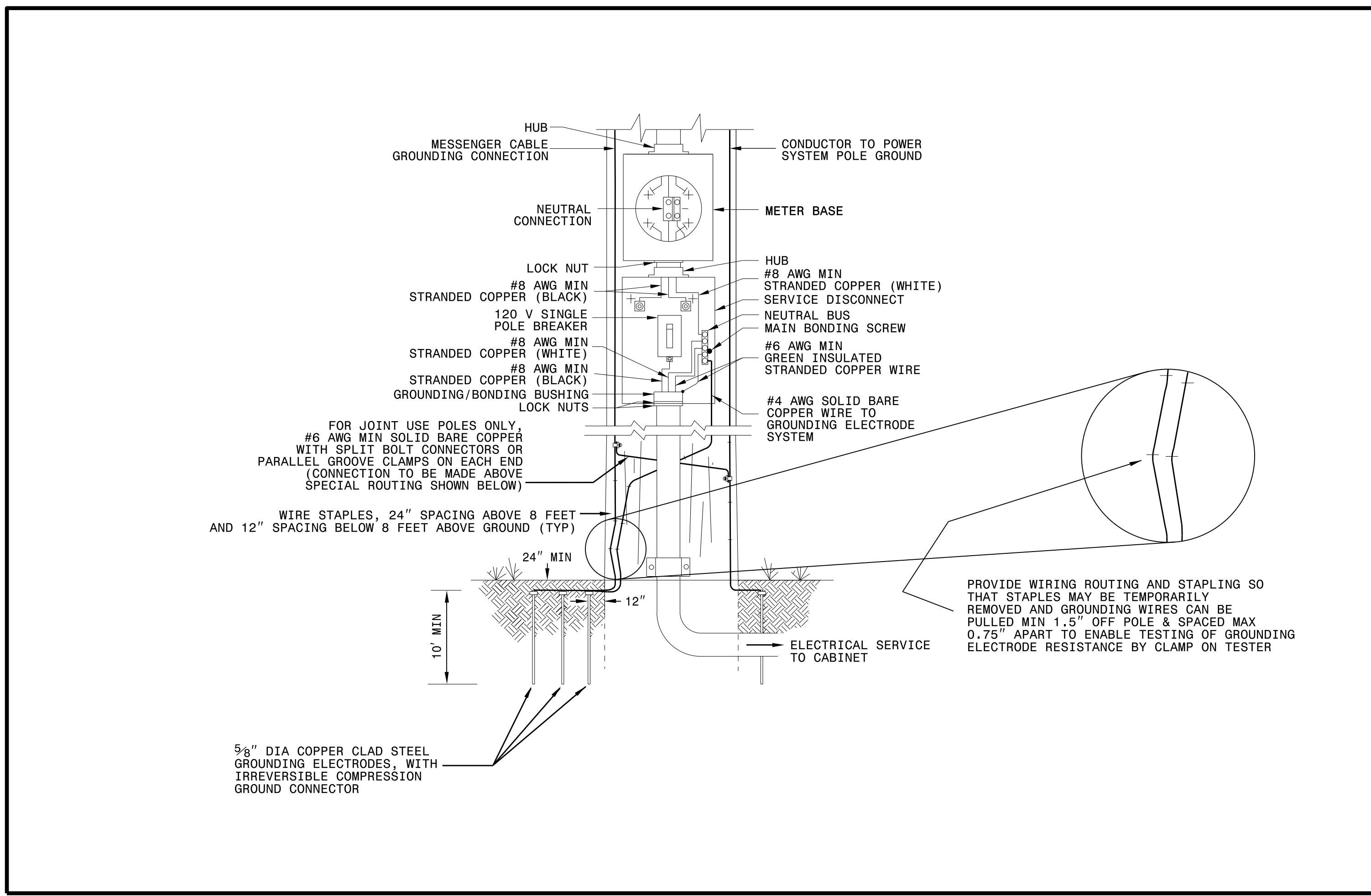
ELECTRICAL DETAIL - FINAL DESIGN - SHEET 2 OF 2

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED



US 221 AT NC 88-US 221 BUSINESS / CHERRY DR.	
DIVISION 11	ASHE COUNTY
JEFFERSON	
PLAN DATE: FEBRUARY 2020	REVIEWED BY: D. SEARS
PREPARED BY: W.P. JONES	REVIEWED BY:
REVISIONS	INIT. DATE

SEAL	DATE
NORTH CAROLINA PROFESSIONAL ENGINEER DAVID T. SEARS	2/7/2020
SIGNATURE	DATE
SIG. INVENTORY NO. 11-0009	



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

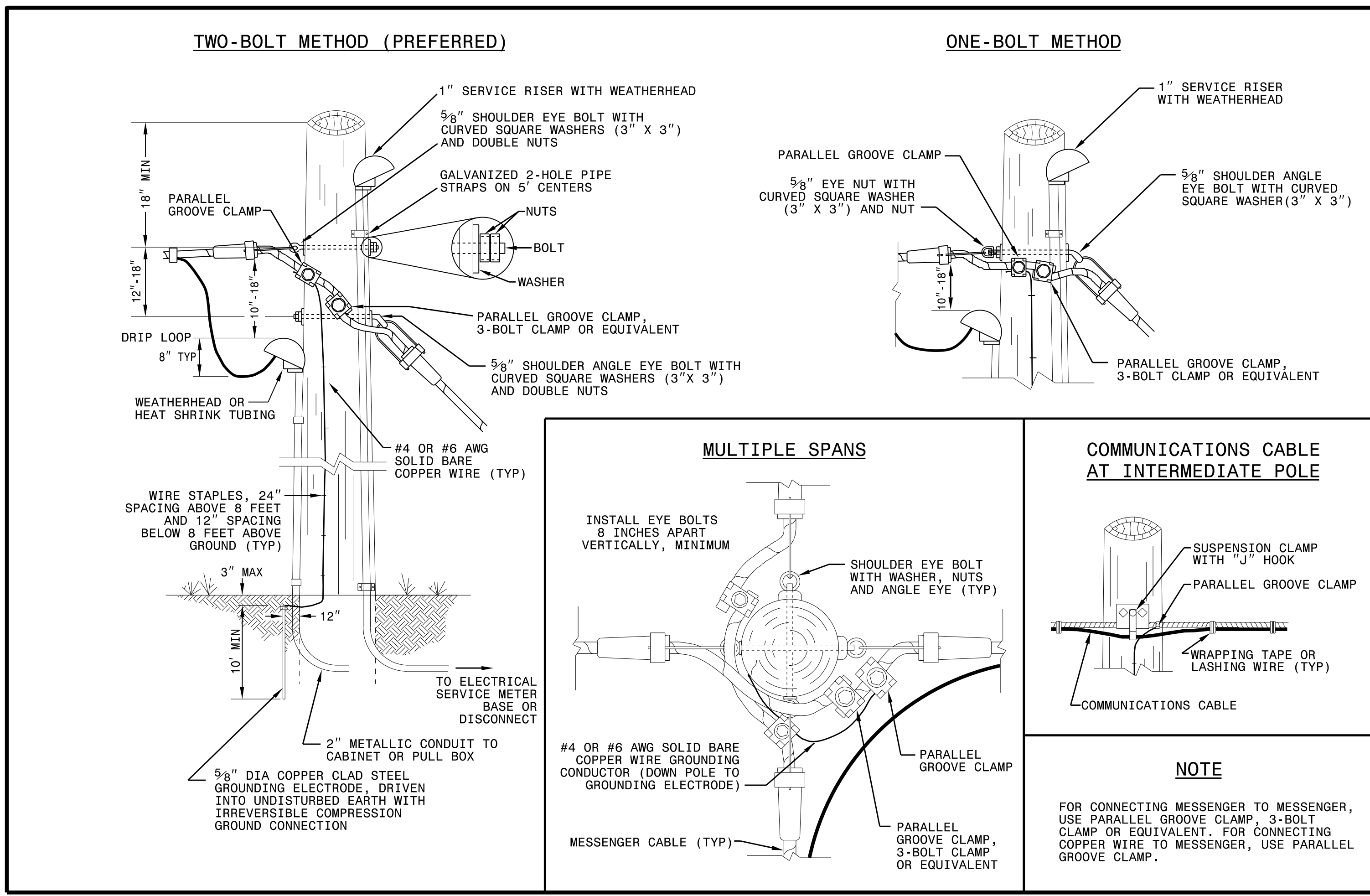
ENGLISH STANDARD DRAWING FOR

ELECTRICAL SERVICE GROUNDING

GROUNDING AND BONDING

SHEET 1 OF 1

1700D01



1-18 STATE OF NORTH CAROLINA DEPT. OF TRANSPORTATION DIVISION OF HIGHWAYS RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR

WOOD POLES

METHODS OF ATTACHMENT AND GROUNDING

SHEET 1 OF 1

1720D01

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

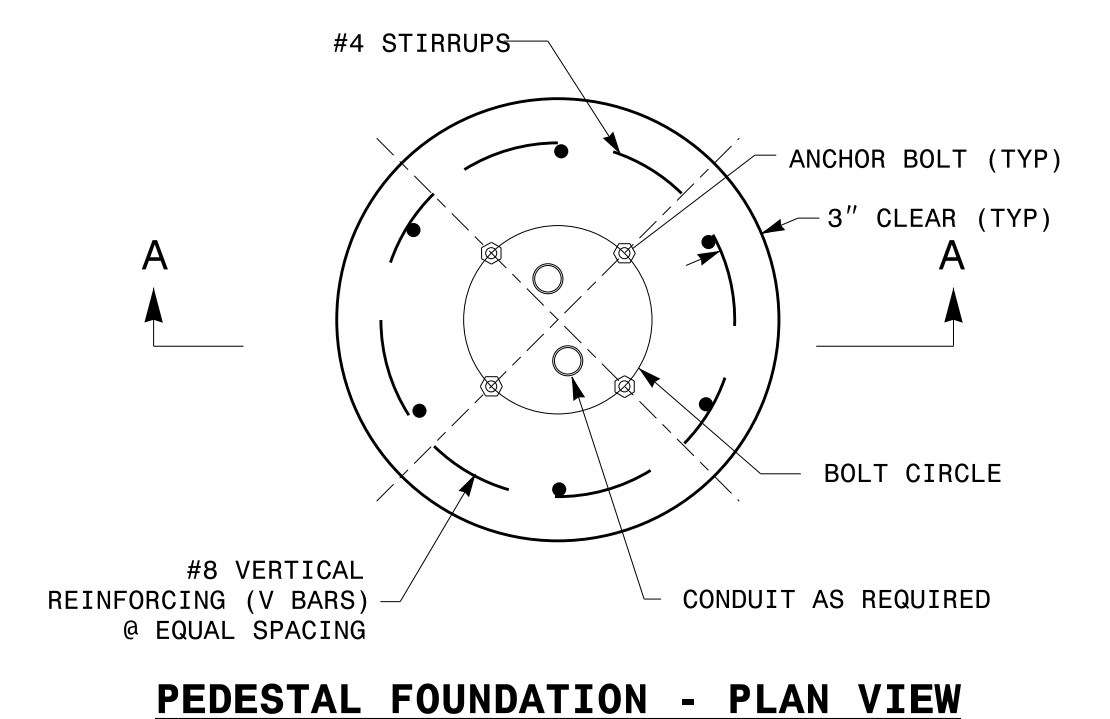
SEAL

DocuSigned by:
Mohd Aslami

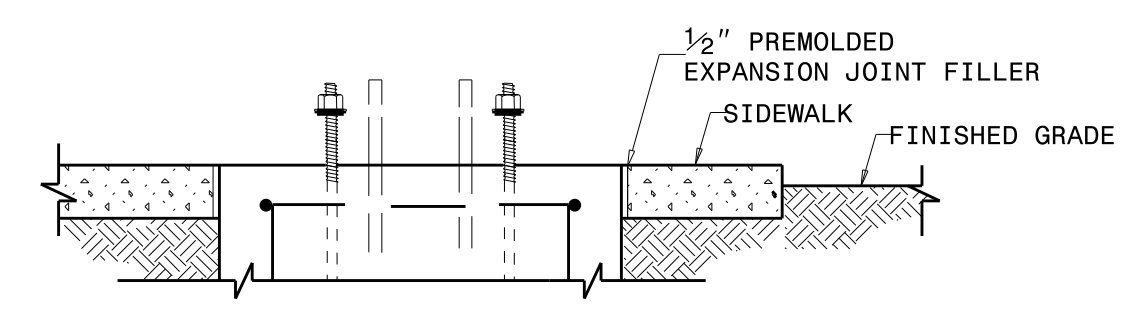
750 N. Greenfield Parkway
Garner, NC 27529

10/11/2017
DATE

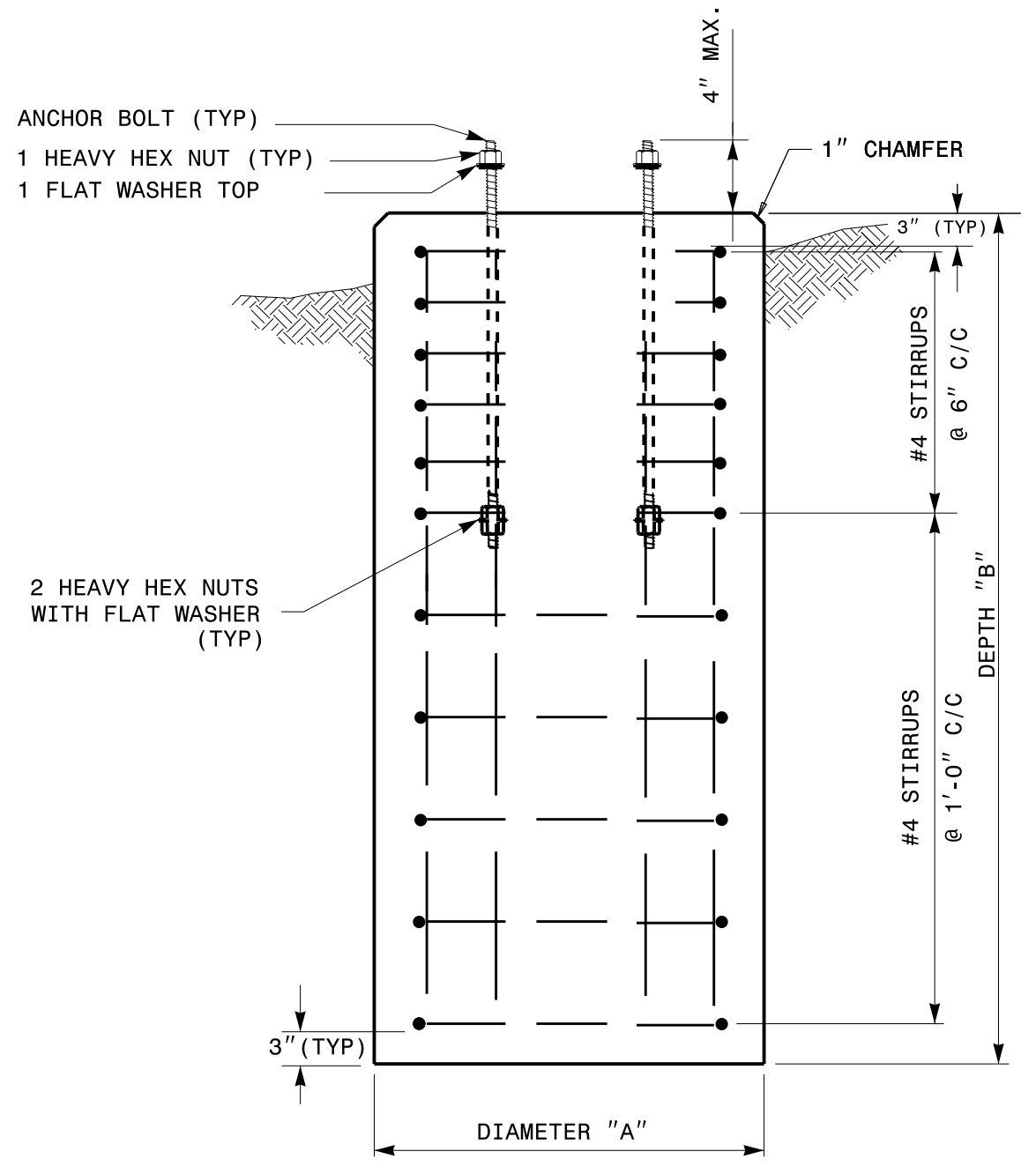
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r:\rough



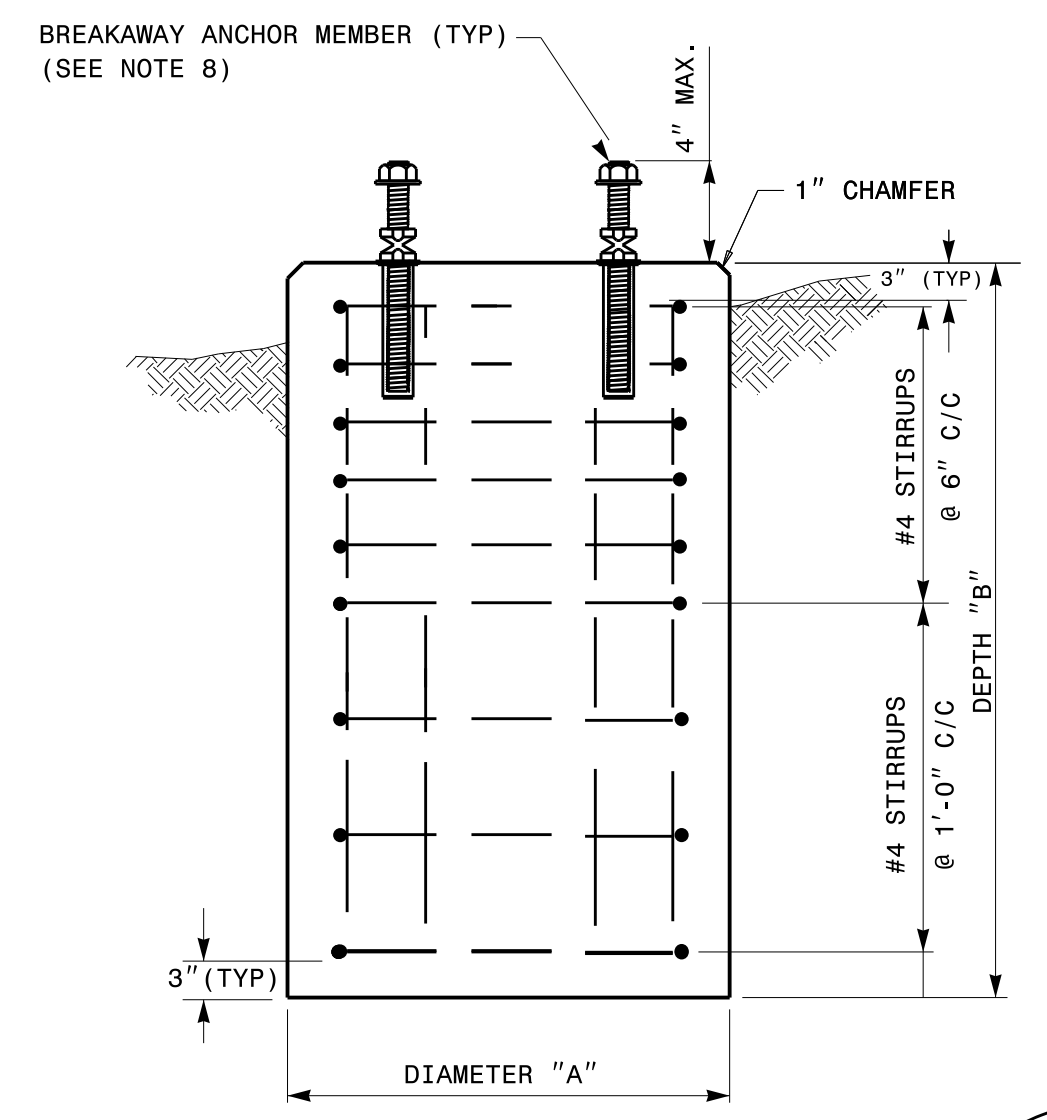
PEDESTAL FOUNDATION - PLAN VIEW



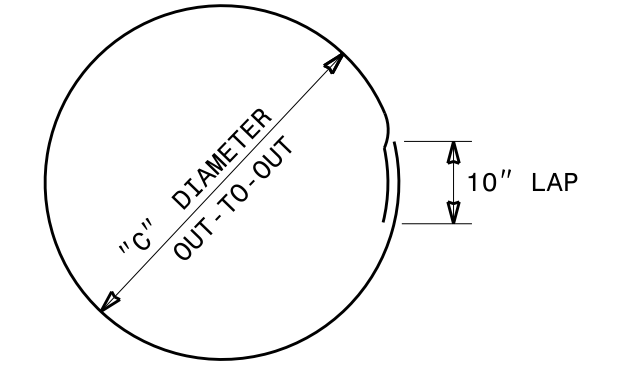
PEDESTAL FOUNDATION DETAILS FOR SIDEWALK



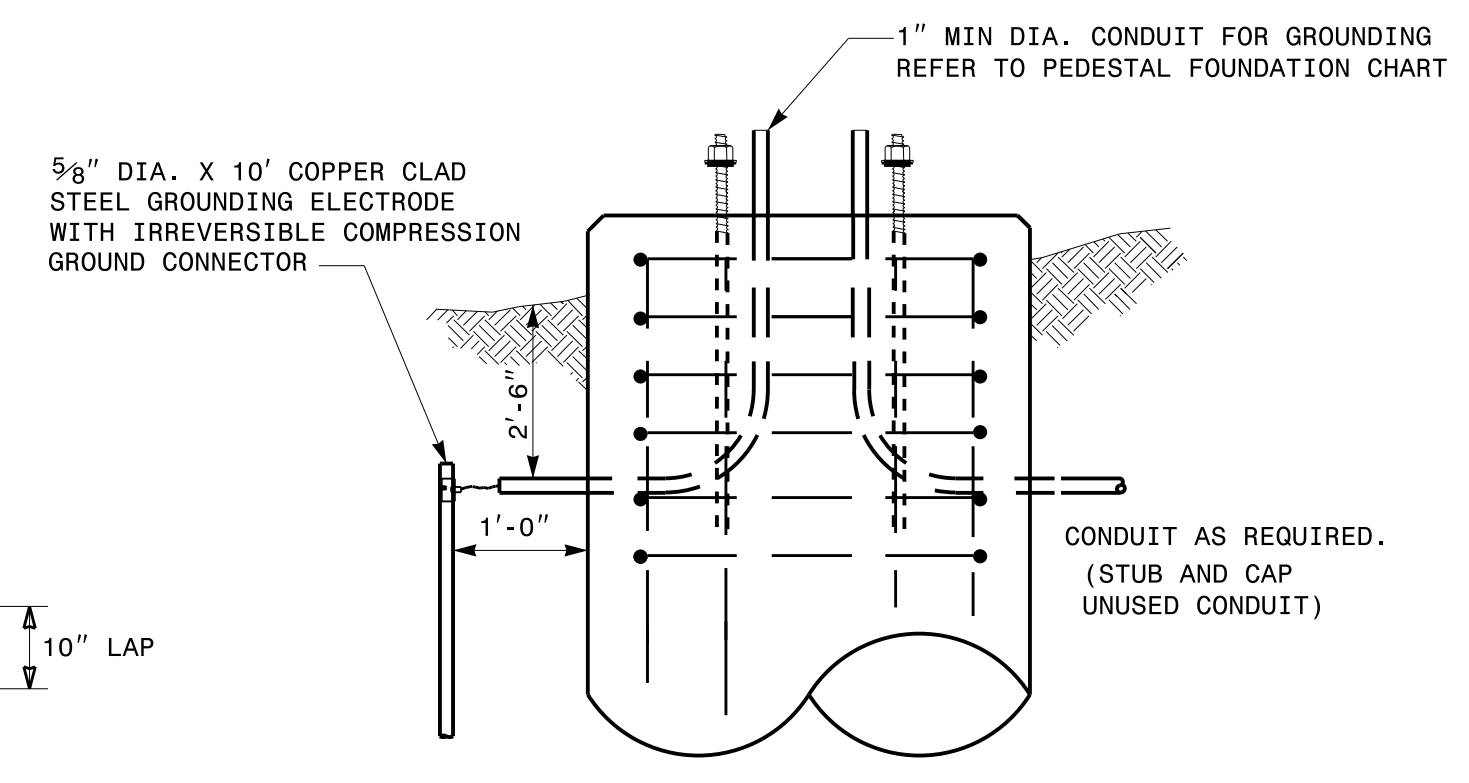
TYPES I, II & III
SECTION A-A



TYPES I & II ONLY
SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

NOTES:

- CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
- COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
- USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF $F'c = 3000$ PSI (MIN.).
- USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
- GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
 - SANDY TYPE SOIL
 - NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
 - WIND SPEED NOT TO EXCEED 140 MPH
 IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
- MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
- ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
- USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4 1/2" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6 5/8". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.

PEDESTAL FOUNDATION TYPE AND SIZE							
TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	1/2	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	3/4	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

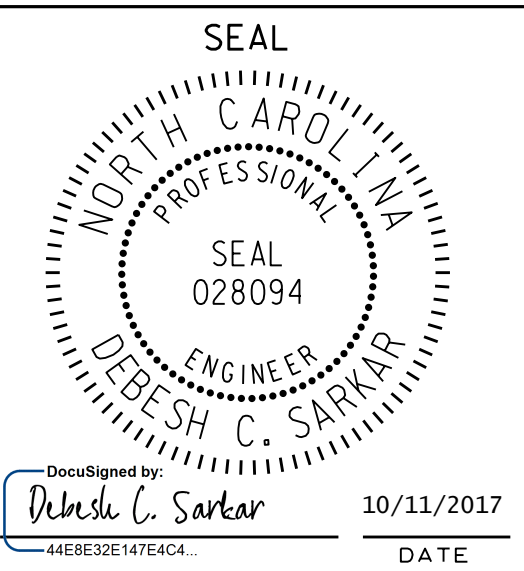
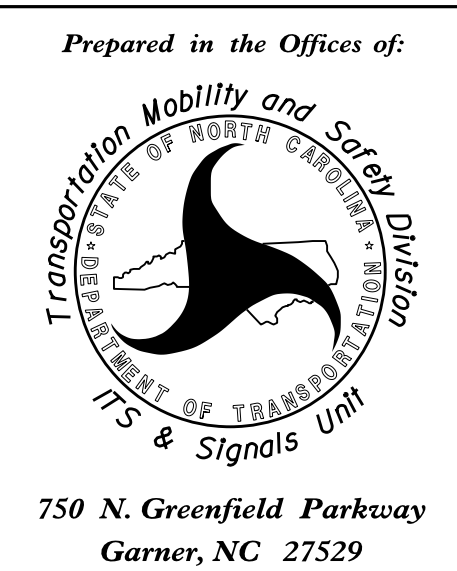
REINFORCING STEEL SCHEDULE												
TYPE	V-BAR				STIRRUP							
	SIZE #	QTY	LENGTH	WEIGHT LBS	QUANTITY			LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	TOTAL STEEL WEIGHT LBS
					VERTICAL ON 6" CENTERS	ON 12" CENTERS	TOTAL					
I	8	6	3'-0"	56	4	0	4	5'-7"	1'-6"	0'-10"	15	71
II	8	6	4'-6"	86	4	5	3	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	7'-2"	2'-0"	0'-10"	53	175

STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1
1743D01

See Plate for Title



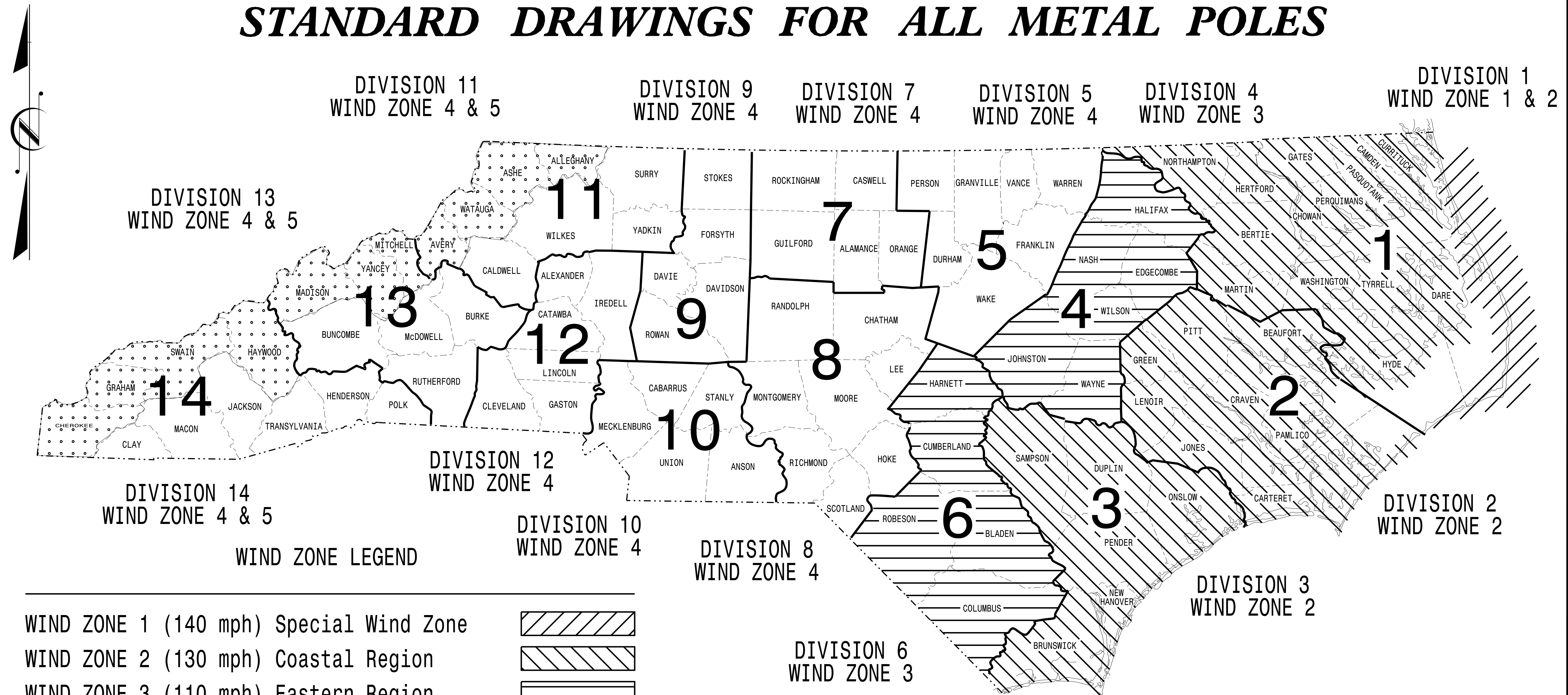
DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

11-10-2017 08:03
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STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO.	SHEET NO.
	Sig.M1

STANDARD DRAWINGS FOR ALL METAL POLES

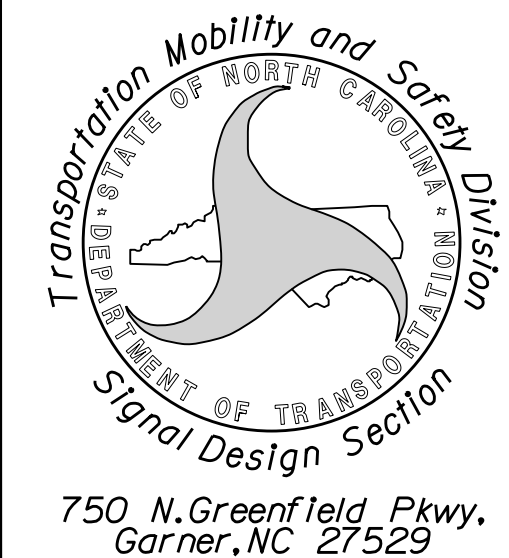


WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone		
WIND ZONE 2 (130 mph) Coastal Region		
WIND ZONE 3 (110 mph) Eastern Region		
WIND ZONE 4 (90 mph) Central & Mtn. Region		
WIND ZONE 5 (120 mph) Special Wind Zone		

<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

Prepared In the Offices of:



Designed in conformance with the latest 2015 Interim to the 6th Edition 2013

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

INDEX OF PLANS

DRAWING NUMBER	DESCRIPTION
Sig. M 1	Statewide Wind Zone Map
Sig. M 2	Typical Fabrication Details-All Metal Poles
Sig. M 3	Typical Fabrication Details-Strain Poles
Sig. M 4	Typical Fabrication Details-Mast Arm Poles
Sig. M 5	Typical Fabrication Details-Mast Arm Connection
Sig. M 6	Typical Fabrication Details-Strain Pole Attachments
Sig. M 7	Construction Details-Foundations
Sig. M 8	Standard Strain Pole Foundation-All Soil Conditions

NCDOT CONTACTS:

MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT

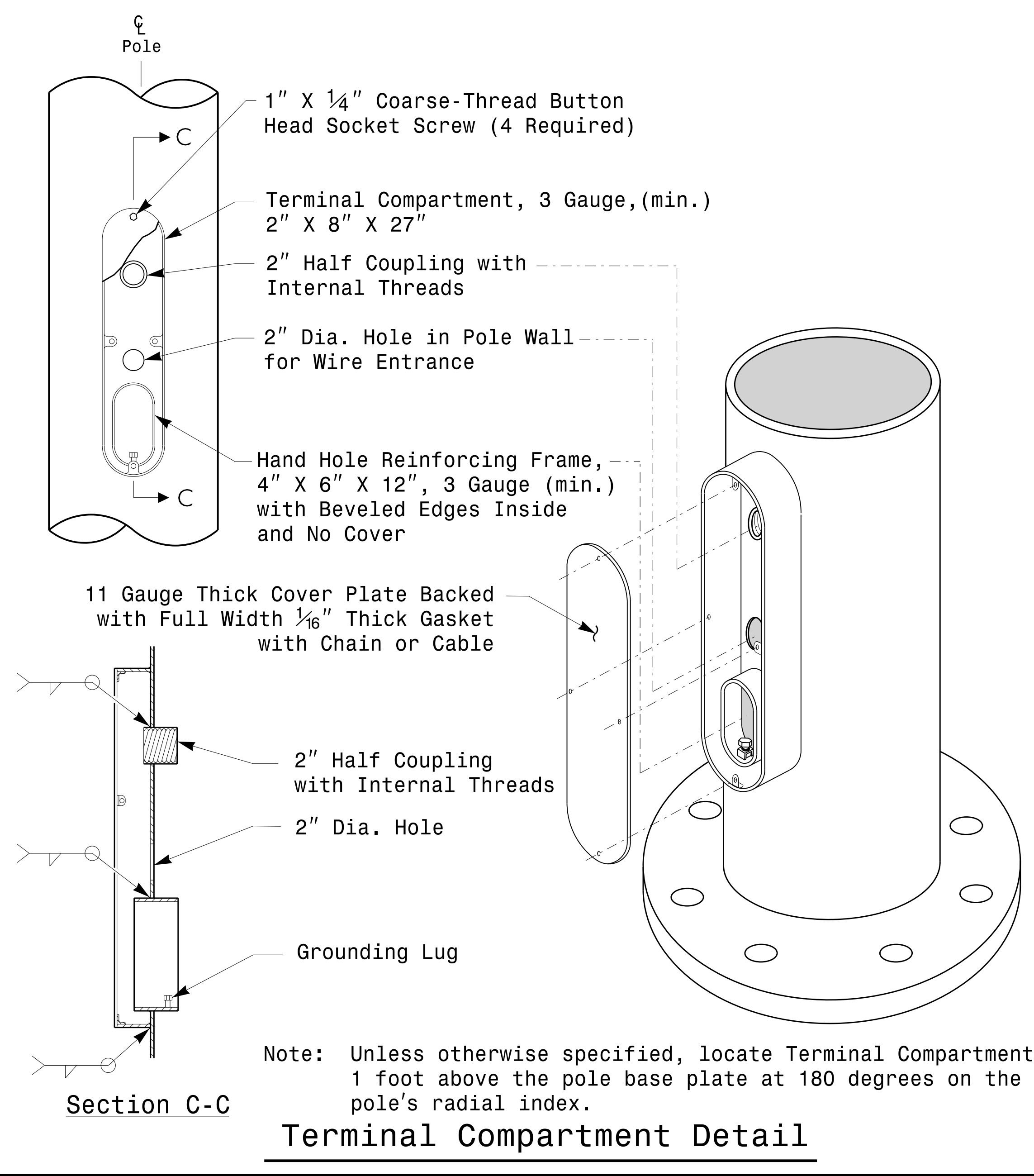
M.M. MC DIARMID, P.E. - STATE ITS AND SIGNALS ENGINEER

J.P. GALLOWAY, P.E. - STATE SIGNALS ENGINEER

D.C. SARKAR, P.E. - ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

SEAL

DocuSigned by:
Debesh C. Sarkar
DATE: 10/11/2017



MFG _____	MFG. DATE: MM/YY _____
SHAFT D/T/L/Y _____	_____
ARM-A D/T/L/Y _____	_____
ARM-B D/T/L/Y _____	_____
A.B. DIA./B.C./L/Y _____	_____
NCDOT SIG. INV. NO. _____	_____
NCDOT POLE NO. _____	_____

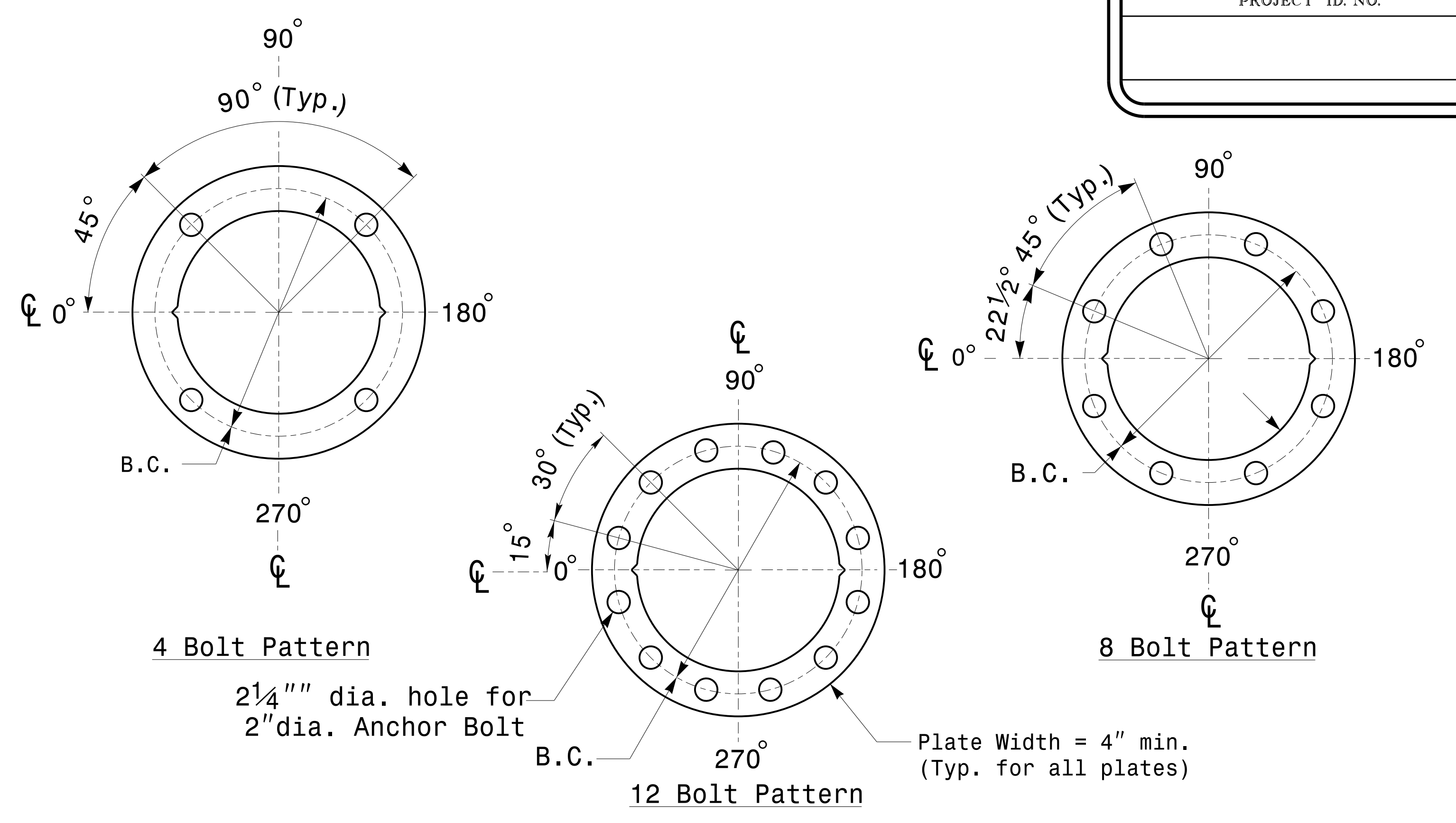
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

- Notes:
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
 - 2) A.B. = Anchor Bolt
 - 3) B.C. = Bolt Circle of Anchor Bolts
 - 4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
 - 5) See drawing M3 and M4 for mounting positions of I.D. tags.

Identification Tag Details

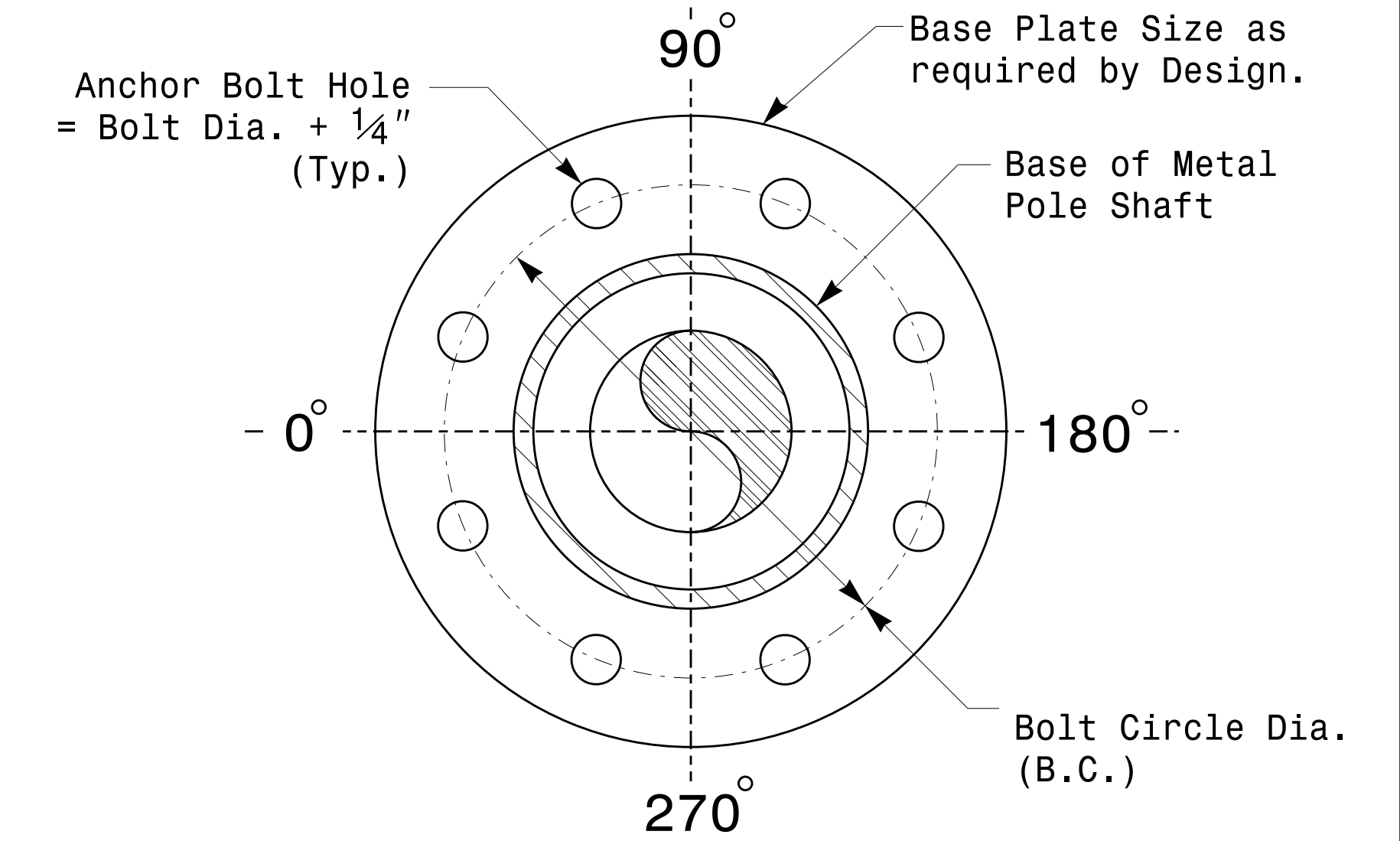
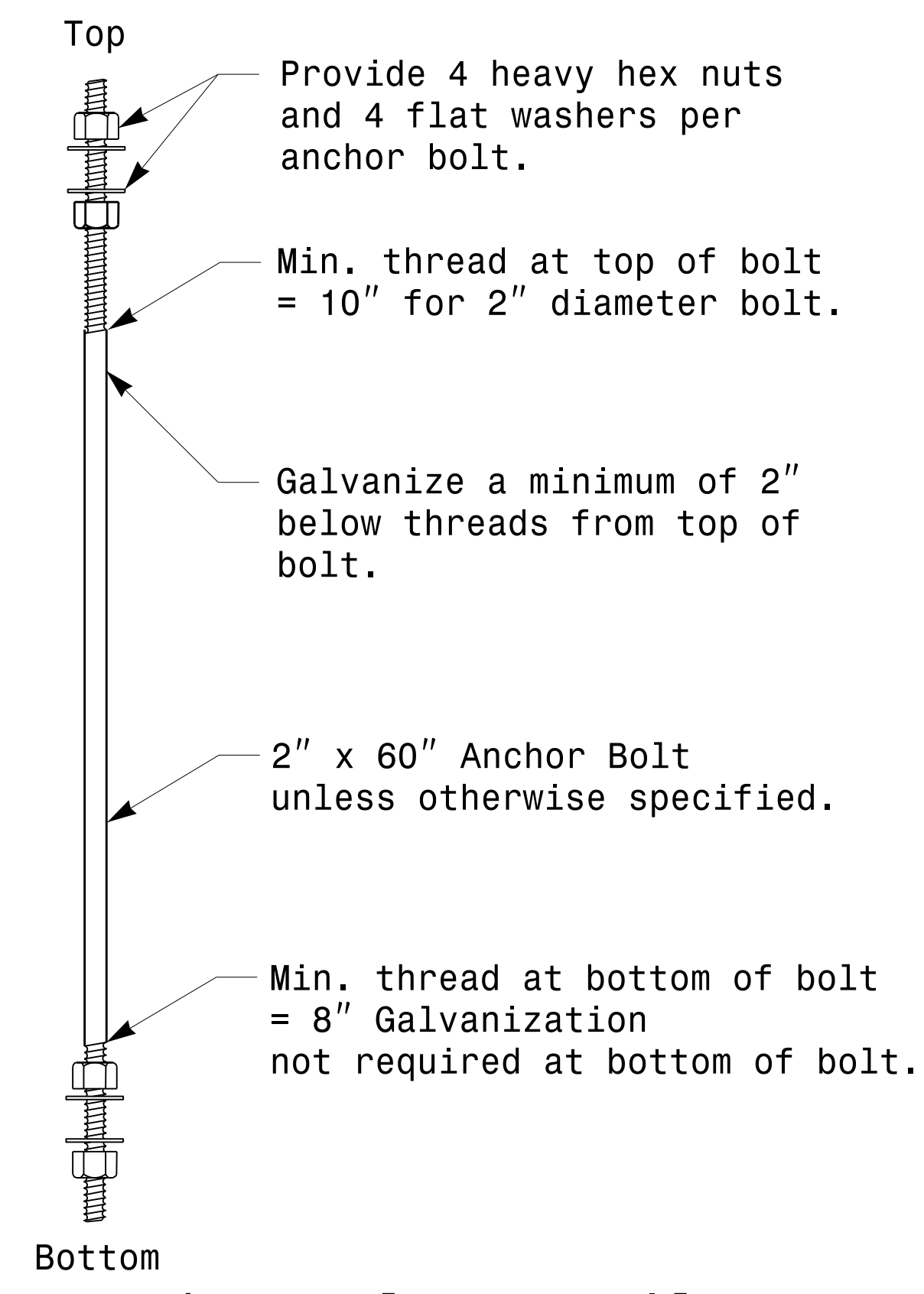
MFG _____	MFG. DATE:MM/YY _____
SECTION D/T/L/Y _____	_____
NCDOT SIG. INV. NO. _____	_____
NCDOT POLE NO. _____	_____

Arm I.D. Tag
(Provide on each section of a multi-section mast arm.)



Construct Templates and Plates from 1/4" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details

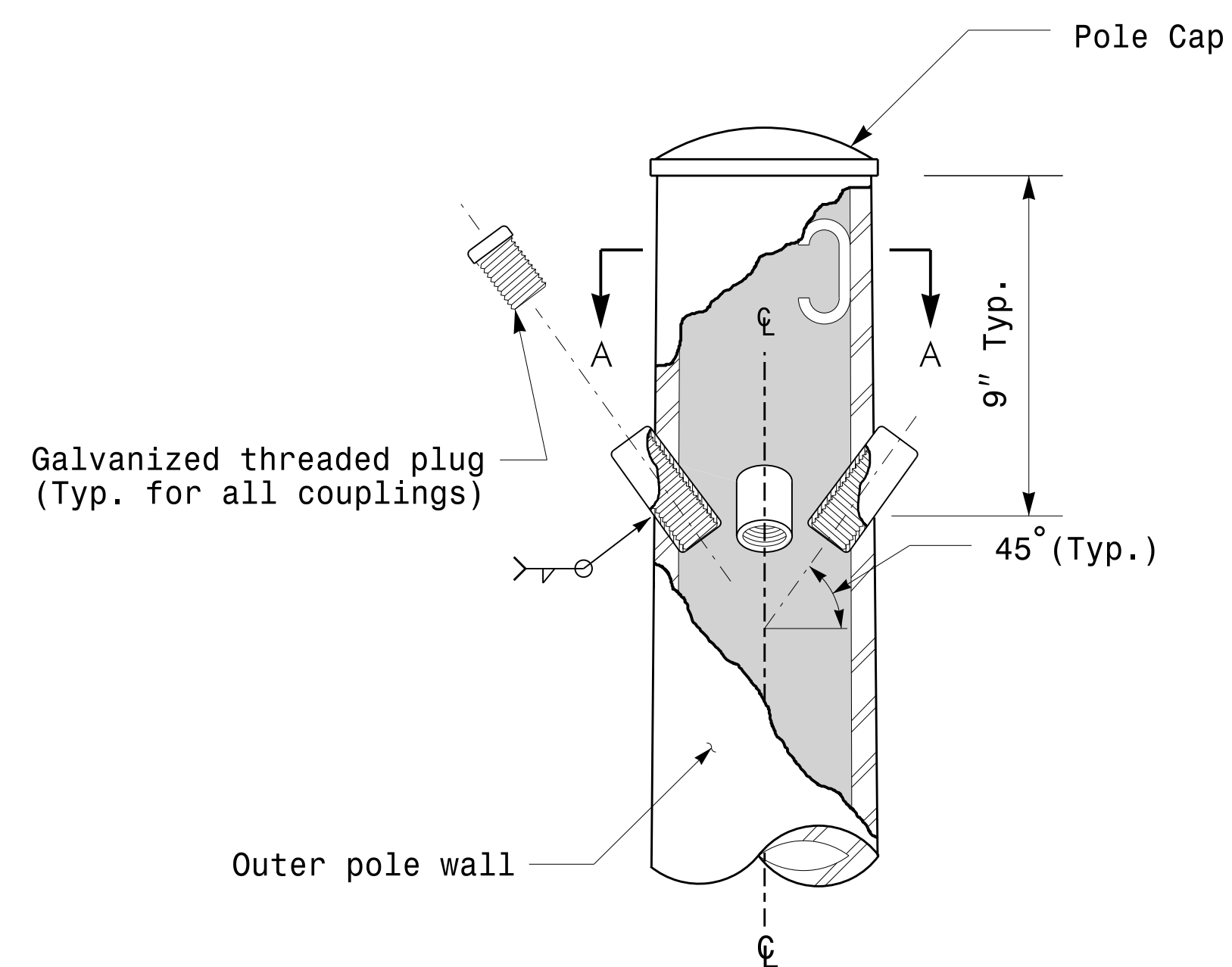


Note: Base plate may be circular, octagonal, square or rectangular in shape.

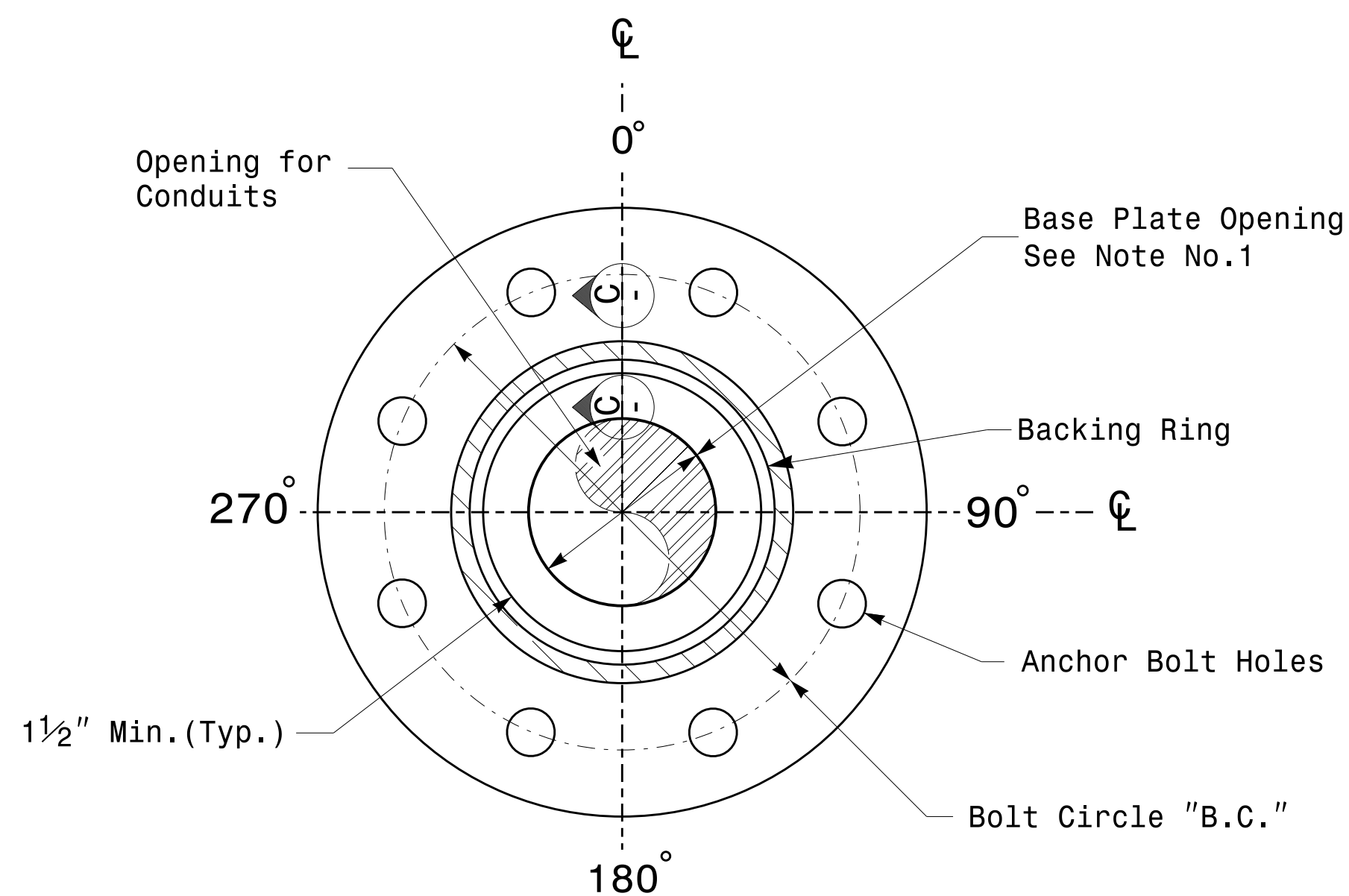
Typical Base Plate Detail

	<p>Typical Fabrication Details For All Metal Poles</p>		
	<p>PLAN DATE: OCTOBER 2017</p>	<p>DESIGNED BY: C.F. ANDREWS</p>	
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>PREPARED BY: N. BITTING</p>	<p>REVISIONS</p>	<p>INITIALS DATE</p>
<p>SCALE: 0 NA NONE</p>			<p>DocuSign by: Dinesh C. Sarkar</p> <p>10/11/2017 DATE</p>

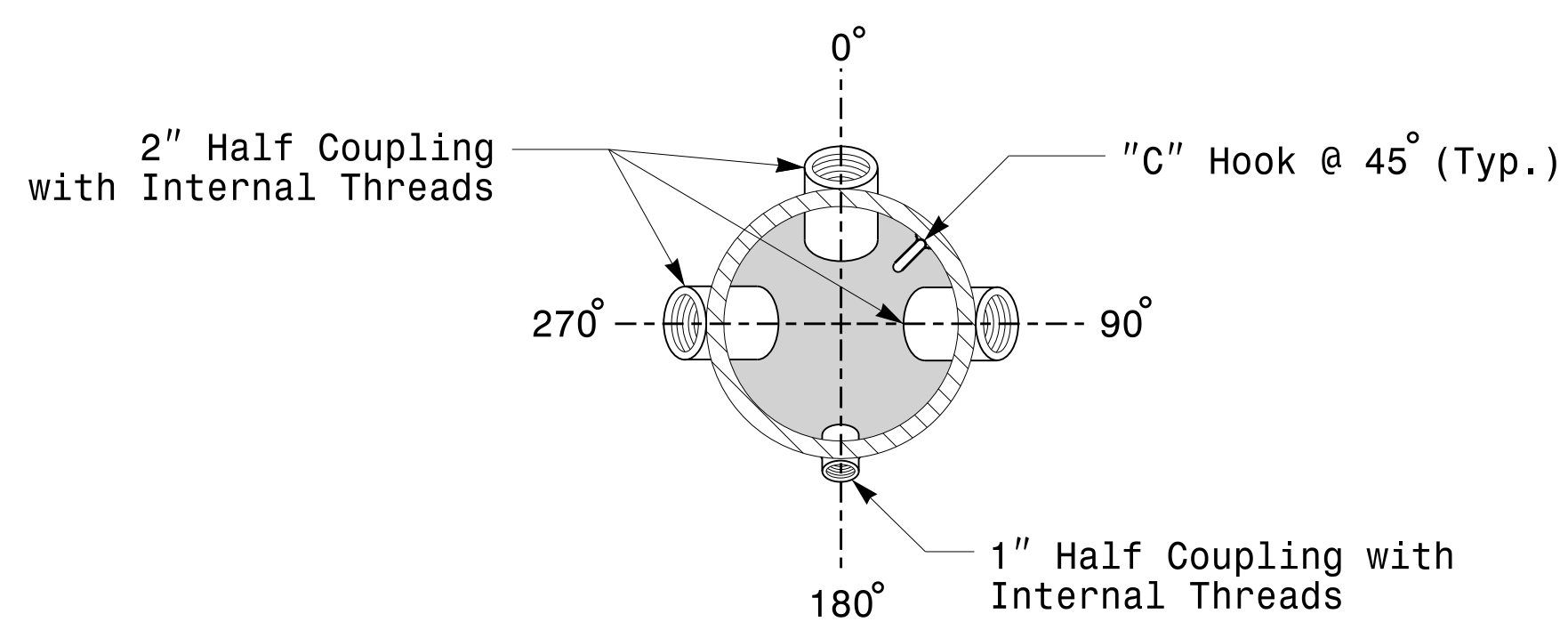
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



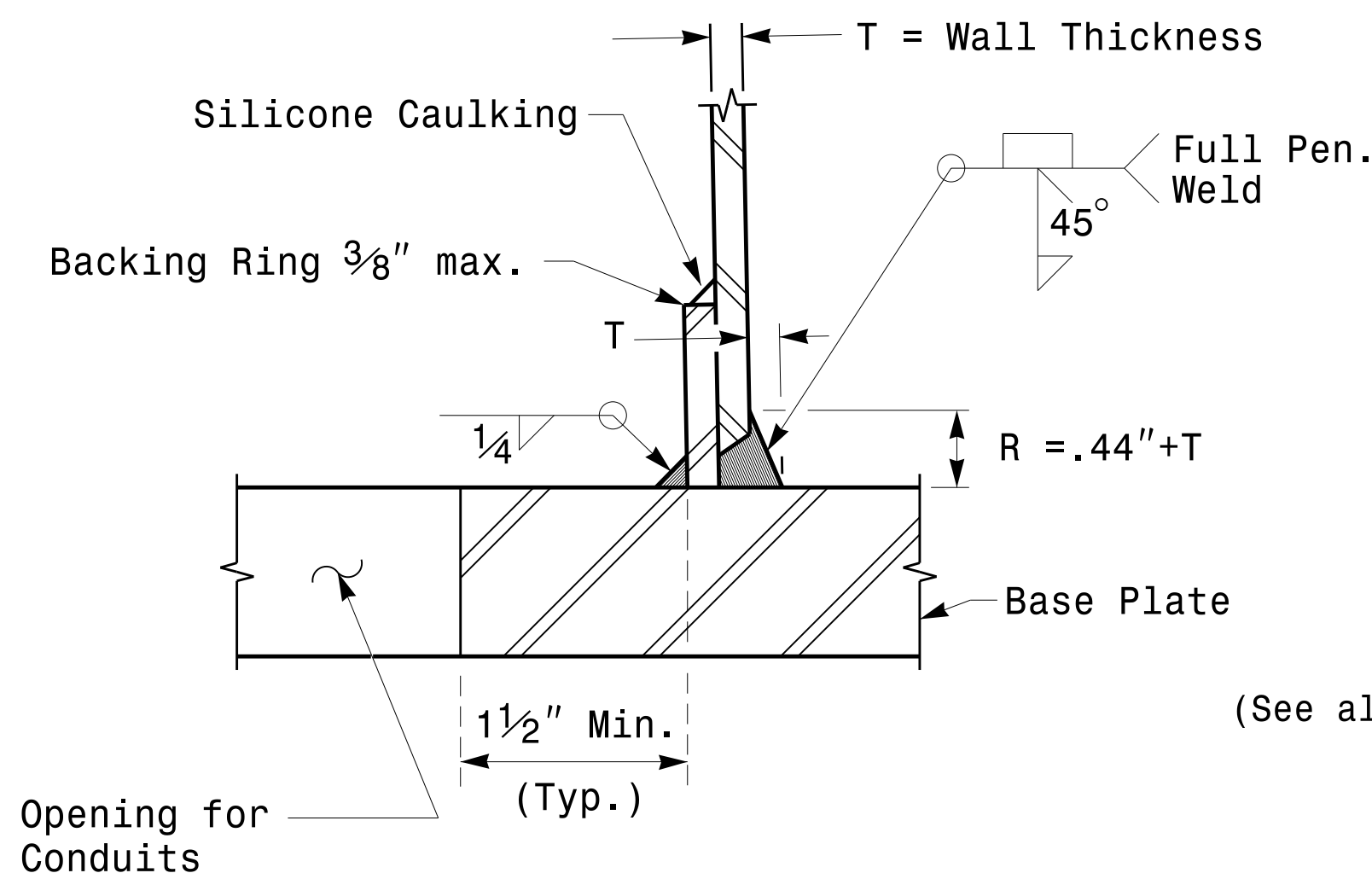
Cable Entrances at Top of Pole



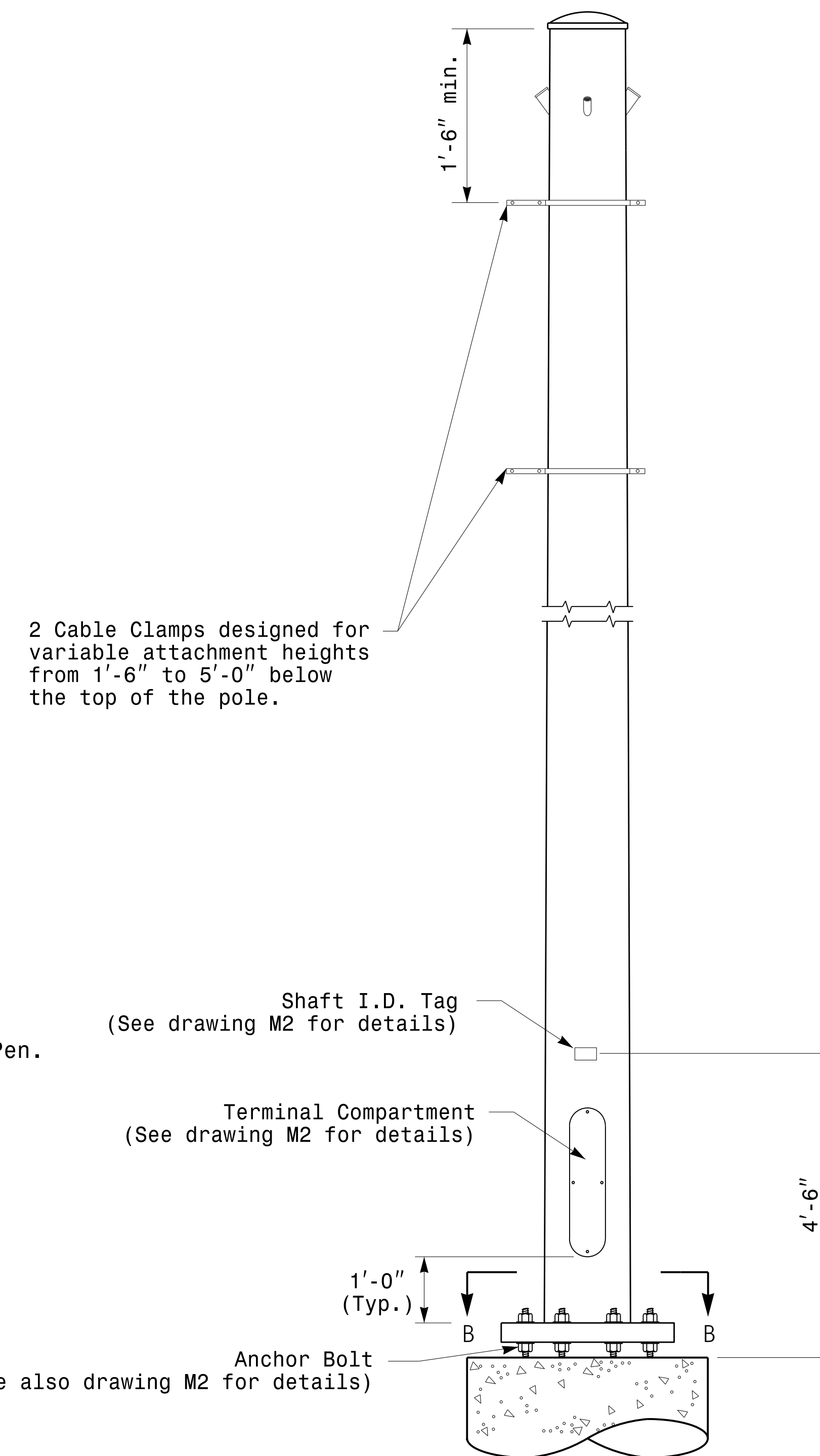
Section B-B
Pole Base Plate Details
(8 and 12 Bolt Pattern)



Section A-A
Radial Orientation for Factory Installed
Accessories at Top of Pole



Section C-C
(Pole Attachment to Base Plate)
Full-Penetration
Groove Weld Detail



Monotube Strain Pole

Prepared in the Offices of:

 750 N. Greenleaf Pkwy, Garner, NC 27529

Typical Fabrication Details For Strain Poles

PLAN DATE: OCTOBER 2017	DESIGNED BY: K.C. DURIGON
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

 SEAL 028094
 ENGINEER
 D.C. SARKAR

DocuSigned by:
 Debesh C. Sarkar

10/11/2017
 DATE